power grid tubes

QUICK REFERENCE CATALOG

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PRICE: $4.00

EIMAC
power grid tubes and accessories

QUICK REFERENCE CATALOG 181

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CATALOG INDEX

To find a specific product, first look under the product category for the initial portion of the type number. Products are listed sequentially according to this number. When more than one product has the same initial number, the products are listed alphabetically by the first set of letter designations. Within these parameters, products are then listed numerically or alphabetically by the remaining number or letter designations.

Also listed is the point of manufacture for each product: **SC** for the San Carlos facility, **SL** for the Salt Lake City facility.

Product	Page	Point of MFG.
Electron Tubes		
2C39A	14	SL
2C39BA	14	SL
2C39WA	14	SL
2CX10,000F	103	SC
2-01C	103	SL
2-50A	103	SL
2-150D	103	SL
2-240A	103	SL
3C24	103	SL
3CPN10A5/7815	103	SL
3CPX100A5/7815R	103	SL
3CPX1500A7	27	SL
3CV30,000A1	103	SC
3CV30,000A3	43	SC
3CV30,000H3	43	SC
3CW2000A7	103	SL
3CW5000A3/8242	44	SL
3CW5000A7	103	SL
3CW5000F1/8241	44	SL
3CW5000F3/8243	44	SL
3CW5000F7	103	SL
3CW5000H3	45	SL
3CW10,000A3	45	SC
3CW10,000H3	46	SC
3CW20,000A1	46	SC
3CW20,000A3	47	SC
3CW20,000A7	47	SC
3CW20,000H3	48	SC
3CW20,000H7	48	SC
3CW30,000H3	49	SC
3CW30,000H7	49	SC
3CW40,000H3	50	SC
3CX100A5/7289	103	SL
3CX400U7/8961	27	SC
3CX600U7	28	SC
3CX1000A7/8283	28	SL
3CX1500A7/8877	29	SL
3CX2500A3/8161	30	SL
3CX2500F3/8251	30	SL
3CX2500H3	30	SL
3CX3000A1/8238	31	SL
3CX3000A7	32	SL
3CX3000F1/8239	31	SL
3CX3000F7/8162	32	SL
3CX4500H3	33	SL
3CX5000A3	33	SC
3CX5000H3	34	SC
3CX10,000A1/8158	34	SC
3CX10,000A3/8159	35	SC
3CX10,000A7/8160	35	SC
3CX10,000H3	36	SC
3CX10,000U7	36	SC
3CX15,000A3	37	SC
3CX15,000A7	37	SC
3CX15,000H3	38	SC
3CX20,000A3	38	SC
3CX20,000A7	39	SC
3CX20,000H3	39	SC
3-200A3/592	103	SL
3-400Z/8163	52	SL
3-500Z	52	SL
3-1000H	53	SL
3-1000Z/8164	53	SL
4CN15A	103	SC
4CPX250K/8950	54	SC
4CS250R	89	SC
4CV8000A	71	SL
4CV35,000A	71	SC
4CV50,000E	72	SC
4CV50,000J	72	SC
4CV100,000C/8351	73	SC
4CV250,000B	73	SC
4CW800B	75	SC
4CW800F	75	SC
4CW2000A/8244	103	SL
4CW10,000A/8661	103	SC
4CW25,000A	75	SC
4CW50,000E	76	SC
4CW50,000J	76	SC
4CW100,000D	77	SC
4CW100,000E	77	SC
4CW250,000B	78	SC
4CX125C	103	SC
4CX250B/7203	54	SC
4CX250BC/8957	55	SC
4CX250FG/8621	54	SC
4CX250K/8245	56	SC
4CX250M/8246	56	SC
4CX250R/7580W	56	SC
4CX300A/8167	57	SC
4CX300Y/8561	57	SC
4CX350A/8321	58	SC
4CX350F/8322	58	SC
4CX350FJ/8904	58	SC
4CX600B	59	SC
4CX600F	59	SC
4CX600J/8809	60	SC
4CX600JA/8921	60	SC
4CX600JB	61	SC
4CX1000A/8168	61	SL
4CX1000K/8352	62	SL
4CX1500A	62	SL
4CX1500B/8660	63	SL
4CX3000A/8169	63	SL
4CX5000A/8170	64	SC
4CX5000J/8909	64	SC
4CX5000R/8170W	65	SC
4CX10,000D/8171	65	SC
4CX10,000J	66	SC
4CX15,000A/8281	66	SC
4CX15,000J/8910	67	SC
4CX20,000A/8990	67	SC
4CX35,000C/8349	68	SC
4CX40,000G	69	SC
4D21/4-125A	82	SL
4E27A/5-125B	103	SL
4PR60B	103	SL
4PR60C/8252W	85	SL
4PR65A/8187	86	SL
4PR125A/8247	86	SL
4PR250C/8248	87	SL
4PR400A/8188	87	SL
4PR1000A/8189	88	SL
4PR1000B	103	SL
4W300B/8249	103	SC
4X150A/7034	103	SC
4X150D/7609	103	SC
4X150G/8172	103	SC
4X500A	103	SL
4-65A	82	SL
4-125A/4D21	82	SL
4-250A/5D22	83	SL
4-400A/8438	83	SL
4-400B/7527	103	SL
4-400C/6775	84	SL
4-500A	84	SL
4-1000A/8166	85	SL
5CX1500A	90	SL
5CX3000A	90	SL
5D22/4-250A	83	SL
5-125B/4E27A	103	SL
5-500A	92	SL
6C21	103	SL
172/8295A	91	SL
177WA/6549W	103	SL
250R	103	SL
250TH	103	SL
250TL	103	SL
253	103	SL
254W	103	SL
264/8576	103	SL
290A	103	SL
304TH	103	SL
304TL	103	SL
450TH	103	SL
450TL	103	SL
592/3-200A3	103	SL
826	103	SL
5867A	103	SL
6155	103	SL
6156	103	SL
6775/4-400C	84	SL
7034/4X150A	103	SC
7035/7609	103	SC
7203/4CX250B	54	SC
7204/4CX250FG	54	SC
7211	15	SL
7289	14	SL
7527/4-400B	103	SL
7580W/4CX250R	56	SL
7609	103	SC
7698	15	SL
7815	16	SL
7815AL	16	SL
7815R	16	SL
7815RAL	103	SL
7855	17	SL
7855K	103	SL
7855KAL	17	SL
8158/3CX10,000A1	34	SC
8159/3CX10,000A3	35	SC
8160/3CX10,000A7	35	SC
8161/3CX2500A3	30	SL
8162/3CX3000F7	32	SL
8163/3-400Z	52	SL
8164/3-1000Z	53	SL
8165/4-65A	82	SL
8166/4-1000A	85	SL
8167/4CX300A	57	SC
8168/4CX1000A	61	SL
8169/4CX3000A	63	SL
8170/4CX5000A	64	SC
8170W/4CX5000R	65	SC
8171/4CX10,000D	65	SC
8172/4X150G	103	SC
8187/4PR65A	86	SL
8188/4PR400A	87	SL
8189/4PR1000A	88	SL
8238/3CX3000A1	31	SL
8239/3CX3000F1	31	SL
8241/3CW5000F1	44	SL
8242/3CW5000A3	44	SL
8243/3CW5000F3	44	SL
8244/4CW2000A	103	SL
8245/4CX250K	56	SC
8246/4CX250M	56	SC
8247/4PR125A	86	SL
8248/4PR250C	87	SL
8249/4W300B	103	SC
8251/3CX2500F3	30	SL
8252W/4PR60C	85	SL
8281/4CX15,000A	66	SC
8283/3CX1000A7	28	SL
8295A/172	91	SL
8321/4CX350A	58	SC
8322/4CX350F	58	SC
8249/4CX35,000C	68	SC
8351/4CV100,000C	73	SC
8352/4CX1000K	62	SL
8403	16	SL
8438/4-400A	83	SL
8533	18	SL
8533W	103	SL
8538B/8933	103	SL
8560A	103	SC
8561/4CX300Y	57	SC
8576/264	103	SL
8590/4CPX250K	54	SC
8621/4CX250FG	54	SC
8660/4CX1500B	63	SL
8661/4CW10,000A	103	SC
8745	103	SL
8755	19	SL
8757	19	SL
8809/4CX600J	60	SC
8847A	20	SL
8873	42	SC
8874	40	SC
8875	40	SC
8877/3CX1500A7	29	SL
8904/4CX350FJ	58	SC
8906	20	SL
8906AL	20	SL
8907	103	SL
8907AL	103	SL
8909/4CX5000J	64	SC
8910/4CX15,000J	67	SC
8921/4CX600JA	60	SC
8930	69	SC
8933/8538B	21	SL
8938	41	SC
8940	21	SL
8941	22	SL
8942	22	SL
8944	103	SL
8954	89	SC
8957/4CX250BC	55	SC
8959	77	SC
8960	88	SL
8961/3CX400U7	27	SC
8962	41	SC
8971/X-2177	50	SC
8972/X-2176	51	SC
8973/X-2170	79	SC
8974/X-2159	80	SC
8989	70	SC
8990/4CX20,000A	67	SC
8990A	68	SC
9008/X-2062J	80	SC
9009/X-2062K	81	SC
C-1149	103	SL
X-2062J/9008	80	SC
X-2062K/9009	81	SC
X-2159/8974	80	SC
X-2170/8973	79	SC
X-2176/8972	51	SC
X-2177/8971	50	SC
X-2203B	74	SC
Y-503	17	SL
Y-518	23	SL
Y-519	23	SL
Y-572BAL	103	SL
Y-579	24	SL
Y-579A	25	SL
Y-667	25	SL
Cavity Amplifiers		
CV-2200	93	SC
CV-2210	93	SC
CV-2250	94	SC
CV-2400	95	SC
CV-2400P	95	SC
CV-2410	95	SC
CV-2410P	95	SC
CV-2800	96	SC
CV-2810	96	SC
CV-8008	97	SL
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CV-8015	98	SL
CV-8018	98	SL
CV-8022	99	SL
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INTRODUCTION

EIMAC Division of Varian manufactures a complete line of power grid tubes and accessories including cavities and associated equipment.

The Division employs over 1400 persons at the San Carlos, California and Salt Lake City, Utah facilities.

Major production at the San Carlos plant includes manufacture of large ceramic/metal power grid tubes, cavities and accessories. Glass power tubes, smaller ceramic/metal tubes and a wide line of planar triode tubes and X-ray tubes are major items manufactured at the Salt Lake City plant.

These two facilities, among the most modern electron tube production plants in the world, have all the manufacturing areas designed on a product flow system for maximum efficiency. Clean rooms for critical assembly work are ventilated and filtered for maximum product yield and reliability. Giant EIMAC developed rotary vacuum pumps provide a high production rate. Facilities for processing ceramic materials include some of the most modern equipment available. Extensive environmental test equipment is at hand for checking product performance under extreme conditions of shock, vibration, humidity and high altitude.

The Advanced Products Laboratory in the San Carlos facility provides product evaluation, application data, prototype production, and precision testing of tube and circuit designs. The Laboratory model shops and tube design engineers are available to assist equipment manufacturers and prime users of EIMAC products with unique applications.

Existing and experimental designs can be adapted by the Laboratory to meet specific customer requirements. Newly developed tube types and circuit techniques are continually being evaluated in the EIMAC Laboratory.

Application Engineering and Marketing Services are available from both the San Carlos and Salt Lake City facilities, as well as from any of the Varian EIMAC Division, Electron Device Group sales offices throughout the world. **In order to facilitate prompt response, inquiries should be directed to the facility manufacturing the specified product.** The Tube and Component Index on the preceding pages lists the point of manufacture of each product by the nomenclature (SC) for San Carlos or (SL) for Salt Lake City.

INTERPRETATION OF CATALOG DATA

Data provided for EIMAC products in this catalog include maximum ratings, typical operation characteristics and a brief description of the product.

The **maximum ratings** are based on the "absolute system" and are not to be exceeded under **any** service conditions. These ratings are limiting values outside which the serviceability of any individual tube may be impaired. In order not to exceed absolute ratings, the designer has the responsibility of determining an average design value for each rating below the absolute value of that rating by a safety factor so that the absolute values will never be exceeded under any usual conditions of the supply-voltage variation, load variation, or manufacturing variations in the equipment itself. It does not necessarily follow that combination of absolute maximum ratings can be attained simultaneously. The maximum ratings designate the maximum of the absolute value of that rating regardless of polarity.

Data provided under **typical operation** represent operating conditions within the maximum ratings that are suitable for a particular application but do not imply that the product cannot be operated satisfactorily under other conditions in the same application.

The term **plate output power** is the calculated output power from the tube itself and is equal to plate input minus plate dissipation. the term **useful power output** is the output measured at the load and does not include power lost in the output circuit.

Information furnished by EIMAC in the catalog is believed to be accurate and reliable. More extensive data is available on individual types on request. Characteristics and operating values are based upon performance tests or calculated data. **These figures may change without notice as the result of additional data or product refinement. It is highly recommended that EIMAC be consulted before using this catalog information for the final equipment design.**

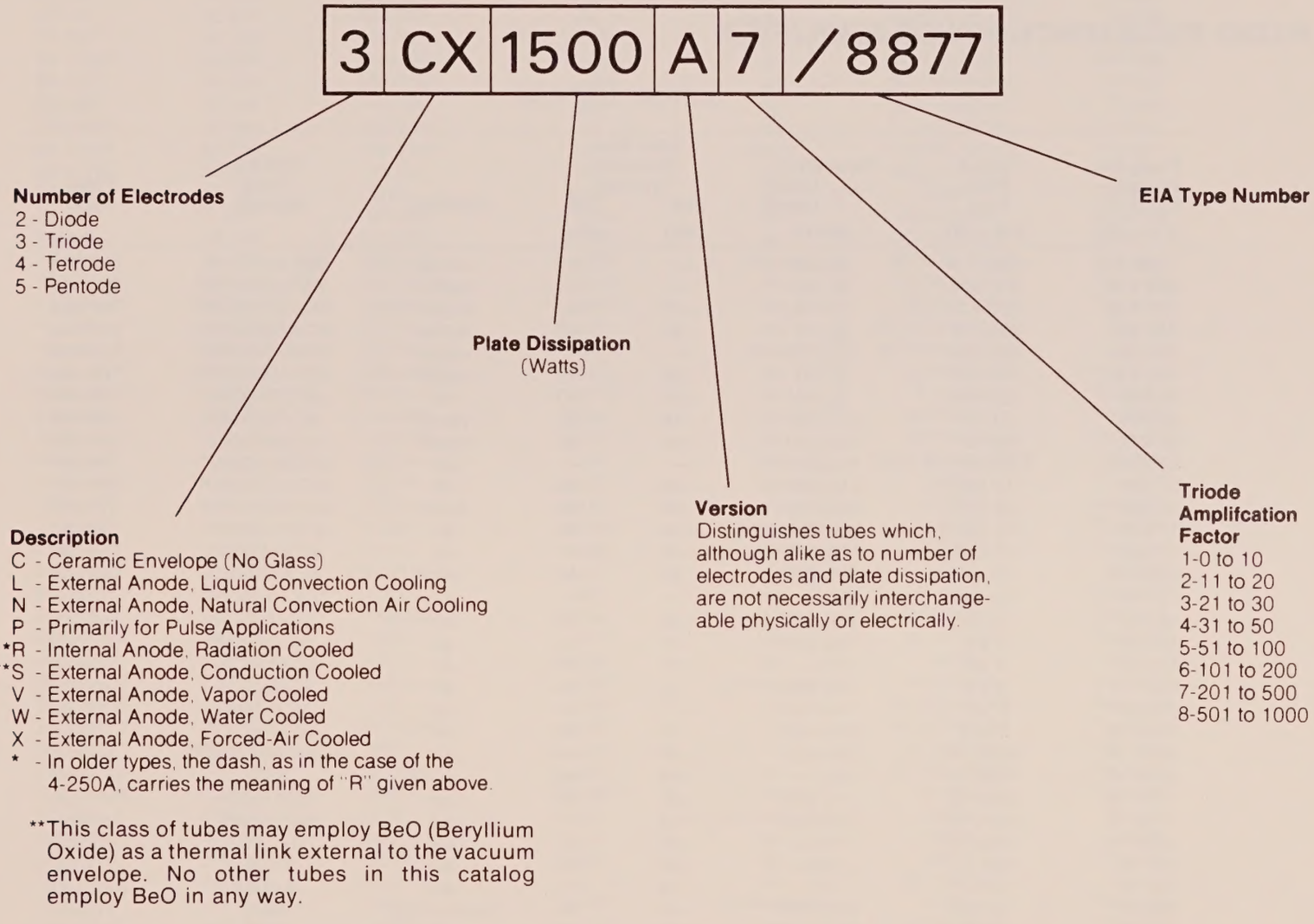
Tentative ratings and characteristics are identified so the user is alerted that possible changes may be made. Contact EIMAC Application Engineering Department at the appropriate plant prior to proceeding on a design.

TUBE TYPE NUMBERING SYSTEM

EIMAC tube types are identified by either a non-descriptive, sequentially-assigned 4-digit type number, standardized and registered with the ELECTRONICS INDUSTRIES ASSOCIATION (EIA), for non-duplication throughout the world, or by an EIMAC-originated coded numbering system, designed to convey descriptive information about the tube. Many tube types can be identified with either number, and are branded with both.

In general, the EIMAC type number consists of: a numeral including the number of electrodes, one or more letters denoting special characteristics, a numeral representing the plate dissipation rating, and a final letter to distinguish the tube from others which may bear similar or preceding letters and numerals. Triode types carry an additional number to indicate their approximate amplification factor.

To illustrate the system, a typical 1500-watt ceramic, external-anode, forced-air cooled EIMAC triode is broken down as follows:


3 CX 1500 A 7 /8877
Number of Electrodes
2 - Diode
3 - Triode
4 - Tetrode
5 - Pentode
Description
C - Ceramic Envelope (No Glass)
L - External Anode, Liquid Convection Cooling
N - External Anode, Natural Convection Air Cooling
P - Primarily for Pulse Applications
*R - Internal Anode, Radiation Cooled
**S - External Anode, Conduction Cooled
V - External Anode, Vapor Cooled
W - External Anode, Water Cooled
X - External Anode, Forced-Air Cooled
* - In older types, the dash, as in the case of the 4-250A, carries the meaning of "R" given above.
**This class of tubes may employ BeO (Beryllium Oxide) as a thermal link external to the vacuum envelope. No other tubes in this catalog employ BeO in any way.
Plate Dissipation
(Watts)
Version
Distinguishes tubes which, although alike as to number of electrodes and plate dissipation, are not necessarily interchangeable physically or electrically.
Triode Amplifcation Factor
1-0 to 10
2-11 to 20
3-21 to 30
4-31 to 50
5-51 to 100
6-101 to 200
7-201 to 500
8-501 to 1000
EIA Type Number

POWER GRID TUBE SELECTION GUIDE

The EIMAC Power Grid Tube Selection Guide is arranged for ease in making type selections by use rather than tube type. The Guide is applications-oriented.

Tube types are listed according to the principal modes of service for which they are rated. Under each mode of service, EIMAC tube types suitable for the application are tabulated in descending order of the most significant tube parameter in the left hand column. For example, in the POWER AMPLIFIER tabulation tube types are listed in descending order of typical rf power output; PULSE REGULATOR tubes are listed in descending order of peak current capability. This format places emphasis on tube application and facilitates comparison in terms of the significant ratings of the EIMAC types available for a given application.

After preliminary selection of a tube type (or types) from the Guide, the final choice should be based upon the complete ratings from the EIMAC data sheet for the tube in question and consultation with the EIMAC Application Engineering Department.

RADIO FREQUENCY POWER AMPLIFIER

Linear Service

Peak Env. Power‡ Typical (kW—W)	Rated Plate Diss. (kW—W)	Frequency* F1/ Upper Useful (MHz)	Inter-Mod. Distortion Typical† 3rd (dB)	5th (dB)	Cooling	EIMAC Type Number	Tube Type
1180 kW	1250 kW	30/50	—	—	water	8974/X-2159	Tetrode
600 kW	650 kW	50/100	—	—	water	8973/X-2170	Tetrode
230 kW	250 kW	30/50	–31	–43	vapor	4CV250,000B	Tetrode
230 kW	250 kW	30/50	–31	–43	water	4CW250,000B	Tetrode
168 kW	100 kW	108/150	—	—	water	4CW100,000E	Tetrode
123 kW	100 kW	30/50	–26	–40	vapor	4CV100,000C	Tetrode
55 kW	35 kW	30/50	–30	–40	air	4CX35,000C	Tetrode
45 kW	50 kW	110/200	–46	–60	vapor	4CV50,000J	Tetrode
45 kW	50 kW	110/200	–46	–60	water	4CW50,000J	Tetrode
27.5 kW	20 kW	110/220	—	—	air	3CX20,000A7	Triode[2]
17 kW	15 kW	110/220	–40	–39	air	3CX15,000A7	Triode[1]
17 kW	20 kW	140/220	–40	–39	water	3CW20,000A7	Triode[1]
17 kW	10 kW	140/220	–40	–39	air	3CX10,000A7	Triode[1]
12 kW	15 kW	110/220	–41	–41	air	4CX15,000J	Tetrode
10.5 kW	10 kW	100/220	–35	–40	air	4CX10,000J	Tetrode
10 kW	10 kW	250/—	—	—	air	3CX10,000U7	Triode[1, 2]
10 kW	5 kW	100/220	–30	–38	air	4CX5000R	Tetrode
5.8 kW	3 kW	150/220	–40	–43	air	5CX3000A	Pentode
5.5 kW	3 kW	110/—	–51	–45	air	3CX3000A7	Triode[1]
5.3 kW	3 kW	150/220	–32	–36	air	4CX3000A	Tetrode
3.3 kW	5 kW	100/220	–41	–44	air	4CX5000J	Tetrode
2060 W	1 kW	220/400	–31	–39	air	3CX1000A7	Triode[1]
2050 W	1500 W	220/400	–38	–44	air	3CX1500A7/8877	Triode[1]
2030 W	1500 W	500/—	–44	–44	air	8938	Triode[1]
1785 W	1500 W	110/220	–33	–42	air	5CX1500A	Pentode
1160 W	1000 W	110/220	–43	–47	air	4CX1500B	Tetrode
1080 W	1000 W	110/—	–29	–37	air	3-1000Z	Triode[1]
740 W	500 W	110/—	–40	–45	air	3-500Z	Triode[1]
645 W	500 W	110/—	–33	–41	air	5-500A	Pentode
590 W	200 W	500/900	–35	–36	conduction	8873	Triode[1]
590 W	400 W	500/900	–35	–36	air	8874	Triode[1]
590 W	300 W	500/900	–35	–36	air	8875	Triode[1]
590 W	400 W	110/—	–28	–35	air	3-400Z	Triode[1]
580 W	600 W	30/—	–43	–43	air	4CX600J	Tetrode
495 W	400 W	110/—	–	–	air	4-400C	Tetrode
350 W	350 W	500/—	–27	–50	air	8930	Tetrode
295 W	250 W	500/—	–25	–30	air	4CX250R	Tetrode
295 W	250 W	500/—	–25	–30	conduction	4CS250R	Tetrode
263 W	350 W	30/220	–30	–35	air	4CX350A	Tetrode
263 W	350 W	30/220	–30	–35	air	4CX350F	Tetrode
263 W	350 W	30/220	–40	–45	air	4CX350FJ	Tetrode

‡Plate power output, calculated or measured at low frequency.
*F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.
†Calculated or measured by two-tone method at 2.0 MHz.
1. Cathode driven. 2. VHF TV

RF POWER AMPLIFIER

Class C, CW or FM Service

Plate Pwr. Output Typical* (kW—W)	Rated Plate Diss. (kW—W)	Frequency† F1/ Upper Useful (MHz)	Power Gain*	Cooling	EIMAC Type Number	Tube Type
1650 kW	1250 kW	30/50	x200	water	8974/X-2159	Tetrode
1050 kW	650 kW	50/100	x300	water	8973/X-2170	Tetrode
460 kW	250 kW	30/50	x150	vapor	4CV250,000B	Tetrode
460 kW	250 kW	30/50	x150	water	4CW250,000B	Tetrode
220 kW	100 kW	108/150	x1800	water	4CW100,000E	Tetrode
168 kW	100 kW	30/50	x1350	vapor	4CV100,000C	Tetrode
165 kW	100 kW	30/50	x140	water	4CW100,000D	Tetrode
137 kW	50 kW	110/220	x900	vapor	4CV50,000E	Tetrode
137 kW	50 kW	110/220	x900	water	4CW50,000E	Tetrode
110 kW	35 kW	30/50	x425	air	4CX35,000C	Tetrode
64 kW	20 kW	90/150	x66	air	3CX20,000A3/H3	Triode
42 kW	25 kW	100/150	x37	water	3CW25,000A3	Triode
38 kW	20 kW	110/220	x170	air	4CX20,000A/8990	Tetrode
36.5 kW	15 kW	110/225	x166	air	4CX15,000A	Tetrode
30 kW	15 kW	100/150	x45	air	3CX15,000A3	Triode
25 kW	15 kW	110/160	x50	air	3CX15,000A7	Triode
24.5 kW	10 kW	140/200	x6	air	3CX10,000A3	Triode[1]
24.5 kW	20 kW	140/200	x6	water	3CW20,000A3	Triode[1]
22.5 kW	10 kW	160/—	x15	air	3CX10,000A7	Triode
20 kW	15 kW	220/—	x850	air	8989	Tetrode
16 kW	5 kW	100/220	x1050	air	4CX5000A	Tetrode
16 kW	10 kW	100/220	x1050	air	4CX10,000D	Tetrode
16 kW	10 kW	100/220	x1050	water	4CW10,000A	Tetrode
16 kW	5000 W	100/220	x1050	air	4CX5000R	Tetrode
11 kW	3000 W	30/100	x260	air	4CX3000A	Tetrode
10 kW	4000 W	75/150	x73	air	3CX2500A3/F3	Triode
10 kW	5000 W	75/150	x73	water	3CW5000A3/F3	Triode
8500 W	3000 W	150/220	x160	air	5CX3000A	Pentode
3400 W	1000 W	110/—	x225	air	4-1000A	Tetrode
3200 W	1500 W	110/220	x350	air	4CX1500A	Tetrode
3180 W	1500 W	110/220	x350	air	5CX1500A	Pentode
2600 W§	1500 W	250/—	x33	air	3CX1500A7/8877	Triode[1]
1500 W§§	1500 W	500/—	x30	air	8938	Triode[1]
1265 W	500 W	110/—	x140	air	4-500A	Pentode
1100 W	400 W	110/—	x190	air	4-400C	Tetrode
1000 W	250 W	110/—	x190	air	4-250A	Tetrode
840 W	350 W	100/150	x31	air	5867A	Triode
805 W	500 W	110/—	x67	air	4-500A	Tetrode
600 W	300 W	110/220	x158	air	4CX300Y	Tetrode
500 W	300 W	500/—	x177	air	4CX300A	Tetrode
450 W	350 W	500/—	x190	air	8930	Tetrode
380 W	250 W	500/—	x190	conduction	4CS250R	Tetrode
380 W	250 W	500/—	x130	air	4CX250B/FG	Tetrode
380 W	250 W	500/1500	x130	air	4CX250K/M	Tetrode
380 W	250 W	500/—	x190	air	4CX250R	Tetrode
380 W	250 W	150/500	x130	air	4X150A/7609	Tetrode
375 W	125 W	120/—	x150	air	4-125A	Tetrode
320 W	200 W	500/—	x35	conduction	8873	Triode
320 W	400 W	500/—	x35	air	8874	Triode
320 W	300 W	500/—	x35	air	8875	Triode
300 W	600 W	1000/—	x31.5	air	3CX600U7	Triode
270 W	65 W	150/—	x160	convection	4-65A	Tetrode
216 W	400 W	1000/—	x11.5	air	3CX400U7	Triode[2]

*Power output and power gain are calculated or measured at low frequency.
†F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced anode voltage and reduced plate input power.
§Power output shown is measured useful, delivered to load, at 104 MHz.
§§Useful power output, measured at 430 MHz.
1. Cathode driven. 2. 900 MHz.

R F POWER AMPLIFIER

Class C—Plate Modulated Service

Carrier Pwr. Output Typical* (kW—W)	Plate Diss. at Typical Conditions (kW—W)	Frequency† F1/ Upper Useful (MHz)	Power Gain*	Cooling	EIMAC Type Number	Tube Type
1375 kW	300 kW	30/50	x200	water	8974/X-2159	Tetrode
700 kW	160 kW	50/100	x290	water	8973/X-2170	Tetrode
285 kW	119 kW	30/50	x120	vapor	4CV250,000B	Tetrode
285 kW	119 kW	30/50	x120	water	4CW250,000B	Tetrode
140 kW	47 kW	30/50	x110	vapor	4CV100,000C	Tetrode
140 kW	35 kW	108/150	x260	water	4CW100,000E	Tetrode
138 kW	22 kW	30/50	x160	water	4CW100,000D	Tetrode
110 kW	22 kW	110/220	x160	water	4CW50,000E	Tetrode
110 kW	22 kW	110/220	x160	vapor	4CV50,000E	Tetrode
55 kW	13 kW	30/50	x440	air	4CX35,000C	Tetrode
29 kW	7 kW	30/—	x800	air	8990A	Tetrode
27.5 kW	7.5 kW	90/150	x18	air	3CX20,000A3	Triode
27.5 kW	7.5 kW	90/150	x18	air	3CX20,000H3	Triode
23.5 kW	5.8 kW	110/225	x155	air	4CX15,000A	Tetrode
23.5 kW	5.8 kW	110/225	x155	vapor	4CV35,000A	Tetrode
18.0 kW	5.4 kW	100/150	x37	air	3CX15,000A3	Triode
12.4 kW	2.6 kW	140/200	x24	air	3CX10,000A3	Triode
8.5 kW	3.5 kW	100/220	x230	air	4CX10,000D	Tetrode
8.5 kW	3.5 kW	100/220	x230	air	4CX5000A	Tetrode
8.5 kW	3.5 kW	100/220	x230	air	4CX5000R	Tetrode
5.75 kW	1.25 kW	150/220	x190	air	4CX3000A	Tetrode
5300 W	950 W	75/150	x45	air	3CX2500A3/F3	Triode
2630 W	670 W	110/—	x290	air	4-1000A	Tetrode
2320 W	780 W	110/220	x230	air	4CX1500A	Tetrode
1960 W	575 W	110/220	x195	air	5CX1500A	Pentode
1765 W	485 W	110/—	x50	air	3-1000Z	Triode
830 W	245 W	110/—	x140	air	4-500A	Tetrode
785 W	280 W	110/—	x110	air	5-500A	Pentode
640 W	185 W	110/—	x25	air	3-500Z	Triode
630 W	195 W	110/—	x190	air	4-400C	Tetrode
510 W	165 W	110/—	x160	air	4-250A	Tetrode
300 W	80 W	120/—	x90	air	4-125A	Tetrode
300 W	200 W	110/220	x175	air	4CX300Y	Tetrode
270 W	280 W	500/—	x160	air	8930	Tetrode
235 W	65 W	500/—	x160	conduction	4CS250R	Tetrode
235 W	65 W	500/—	x135	air	4CX250B	Tetrode
235 W	65 W	500/—	x135	air	4CX250FG	Tetrode
235 W	65 W	500/1500	x135	air	4CX250K	Tetrode
235 W	65 W	500/1500	x135	air	4CX250M	Tetrode
235 W	65 W	500/—	x160	air	4CX250R	Tetrode
235 W	65 W	500/—	x135	air	4CX300A	Tetrode
235 W	65 W	150/500	x135	air	4X150A	Tetrode
235 W	65 W	150/500	x135	air	7609	Tetrode
210 W	45 W	150/—	x65	convection	4-65A	Tetrode

*Power output and power gain are calculated or measured at low frequency.

†F1 is the maximum frequency at which maximum ratings apply. Operating at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.

INDUSTRIAL SERVICE

Class C—Oscillator or Amplifier

Plate Pwr. Output Typical* (kW—W)	Rated Plate Diss. (kW—W)	Filament Heating Power (Watts)	Frequency† F1/ Upper Useful (MHz)	Cooling	EIMAC Type Number	Tube Type
1600 kW	1000 kW	26640	30/60	water	8972/X-2176	Triode
750 kW	500 kW	13320	30/60	water	8971/X-2177	Triode
70 kW	40 kW	1600	90/—	water	3CW40,000H3	Triode
60 kW	20 kW	1600	90/—	air	3CX20,000H3	Triode
42 kW	30 kW	1020	90/—	water	3CW30,000H3	Triode
42 kW	30 kW	1020	100/—	vapor	3CV30,000H3	Triode
41.2 kW	15 kW	1020	90/—	air	3CX15,000H3	Triode
29 kW	10 kW	742	90/—	air	3CX10,000H3	Triode
28 kW	20 kW	742	90/—	water	3CW20,000H3	Triode
20.6 kW	10 kW	566	90/—	water	3CW10,000H3	Triode
18.6 kW	5 kW	566	90/—	air	3CX5000H3	Triode
10 kW	5 kW	379	75/150	water	3CW5000H3	Triode
8.3 kW	4.5 kW	550	75/—	air	3CX4500A3/H3	Triode
5 kW	2.5 kW	379	75/150	air	3CX2500A3/F3/H3	Triode
2.0 kW	1.0 kW	150	100/—	air	3-1000H	Triode
1.2 kW	300 W	125	40/80	air	304TL	Triode
680 W	350 W	70	100/—	air	5867A	Triode

*Plate power output, calculated or measured at low frequency.

†F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.

REGULATOR SERVICE

Voltage or Current

Maximum Pass Current (Adc)	Maximum Hold-off Voltage* (kVdc)	Minimum Tube Drop (Vdc)	Rated Plate Diss. (kW—W)	Cooling	EIMAC Type Number	Tube Type
300	40 kV	3000	1250 kW	water	8974/X-2159	Tetrode
150	40 kV	2500	650 kW	water	8973/X-2170	Tetrode
90	130 kV	2000	1000 kW	water	9009/X-2062K	Tetrode
90	100 kV	2000	300 kW	water	9008/X-2062J	Tetrode
50	40 kV	4400	250 kW	water	4CW250,000B	Tetrode
35	40 kV	2700	100 kW	water	4CW100,000E	Tetrode
30	40 kV	3300	100 kW	water	4CW100,000D	Tetrode
15	35 kV	3000	50 kW	water	4CW50,000E	Tetrode
15	40 kV	2200	35 kW	air	4CX35,000C	Tetrode
7.5	10 kV	1500	20 kW	water	3CW20,000A1	Triode
7.5	20 kV	1200	20 kW	water	3CW20,000A7	Triode
7	10 kV	1300	12 kW	air	3CX10,000A1	Triode
6	20 kV	800	25 kW	water	4CW25,000A	Tetrode
4	20 kV	500	15 kW	air	3CX15,000A7	Triode
4	15 kV	2000	10 kW	water	4CW10,000A	Tetrode
3	12 kV	1300	5000 W	water	3CW5000A1	Triode
2	12 kV	1000	3000 W	air	3CX3000F1	Triode
2	6 kV	1000	2000 W	water	4CW2000A	Tetrode
1	8 kV	250	1500 W	air	3CX1500A7	Triode
1	6 kV	500	1000 W	air	4CX1000A	Tetrode
1	6 kV	500	800 W	water	4CW800B	Tetrode
1	6 kV	500	800 W	water	4CW800F	Tetrode
0.8	4.5 kV	300	400 W	air	8874	Triode
0.8	4.5 kV	300	300 W	air	8875	Triode
0.8	4.5 kV	300	200 W	conduction	8873	Triode
0.6	30 kV	500	100 W	air	4PR1000A	Tetrode
0.6	8 kV	400	500 W	air	3-500Z	Triode
0.2	20 kV	1800	400 W	air	4PR400A	Tetrode
0.2	50 kV	1000	250 W	air	4PR250C	Tetrode
0.1	18 kV	1200	125 W	air	4PR125A	Tetrode
0.1	15 kV	500	65 W	convection	4PR65A	Tetrode

*Consult EIMAC Application Engineering Department at the appropriate plant for regulator range characteristics.

RF POWER AMPLIFIER

Grid Pulsed Service

Peak RF Pwr. Output Typical[β] (kW—W)	Rated Plate Diss. (kW—W)	Frequency† F1/Upper Useful (MHz)	Maximum Plate Voltage (kVdc)	Maximum Plate Current[β] (A)	Cooling	EIMAC Type Number	Tube Type
3900 kW	1250 kW	30/50	30	195	water	8974/X-2159	Tetrode
2000 kW	650 kW	50/100	30	100	water	8973/X-2170	Tetrode
1000 kW	100 kW	108/150	30	50	water	4CW100,000E	Tetrode
500 kW	50 kW	110/220	30	33	vapor	4CV50,000E	Tetrode
500 kW	50 kW	110/220	30	33	water	4CW50,000E	Tetrode
160 kW	15 kW	110/225	12	20	air	4CX15,000A	Tetrode
80 kW	10 kW	110/220	10	13	air	4CX10,000D	Tetrode
80 kW	10 kW	110/220	10	13	air	4CX5000A	Tetrode
80 kW	10 kW	100/220	10	13	air	4CX5000R	Tetrode
34 kW	1.0 kW	110/—	15	3.5	air	4PR1000A	Tetrode
28 kW*	250 W	500/1500	7	6.0	air	4CPX250K	Tetrode
28 kW*	250 W	500/1500	7	6.0	air	4CX250K	Tetrode
28 kW*	250 W	500/1500	7	6.0	air	4CX250M	Tetrode
26 kW	1500 W	500/—	5	8	air	8938	Triode
11 kW	400 W	110/—	10	1.7	air	4PR400A	Tetrode
10 kW‡	250 W	500/1500	5.5	0.8	air	4CPX250K	Tetrode
4000 W	125 W	120/—	9	0.7	air	4PR125A	Tetrode
2600 W	300 W	110/220	3	1.3	air	4CX300Y	Tetrode
2000 W	65 W	150/—	7.5	0.4	convection	4PR65A	Tetrode
1600 W	200 W	500/—	3	0.8	conduction	8873	Triode
1600 W	400 W	500/—	3	0.8	air	8874	Triode
1600 W	300 W	500/—	3	0.8	air	8875	Triode
1600 W	250 W	500/—	3	0.8	air	4CX250B	Tetrode
1600 W	250 W	500/—	3	0.8	air	4CX250F	Tetrode
1600 W	250 W	500/1500	3	0.8	air	4CX250K	Tetrode
1600 W	250 W	500/1500	3	0.8	air	4CX250M	Tetrode

[β]Average during the pulse. Power output data is plate power (does not include circuit losses), calculated or measured at low frequency.
† F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate power input.
*Plate and screen-grid pulsed.
‡ Cathode driven, screen pulsed.

AF POWER AMPLIFIER OR MODULATOR SERVICE

AF Pwr. Output Typical (2 tubes) (kW—W)	Plate Diss. at Typical Conditions Per Tube (kW—W)	Class of Service	Driving Power (2 tubes) (W)	Cooling	EIMAC Type Number	Tube Type
1900 kW	420 kW	AB1	0	water	8974/X-2159	Tetrode
950 kW	210 kW	AB1	0	water	8973/X-2170	Tetrode
660 kW	260 kW	AB1	0	vapor	4CV250,000B	Tetrode
660 kW	260 kW	AB1	0	water	4CW250,000B	Tetrode
246 kW	57 kW	AB1	0	vapor	4CV100,000C	Tetrode
246 kW	57 kW	AB1	0	water	4CW100,000D	Tetrode
200 kW	46 kW	AB1	0	water	4CW100,000E	Tetrode
195 kW	42 kW	AB1	0	water	4CW50,000E	Tetrode
195 kW	42 kW	AB1	0	vapor	4CV50,000E	Tetrode
195 kW	42 kW	AB1	0	vapor	4CV50,000J	Tetrode
195 kW	42 kW	AB1	0	water	4CW50,000J	Tetrode
70 kW	20 kW	AB1	0	air	4CX35,000C	Tetrode
66 kW	20.5 kW	AB1	0	vapor	4CV35,000A	Tetrode
57 kW	14 kW	AB1	0	water	4CW25,000A	Tetrode
57 kW	14 kW	AB1	0	air	4CX15,000A	Tetrode
31.9 kW	9 kW	AB1	0	air	4CX10,000D	Tetrode
29.1 kW	10 kW	AB1	0	air	3CX10,000A1	Triode
29.1 kW	10 kW	AB1	0	water	3CW20,000A1	Triode
17.5 kW	4.20 kW	AB1	0	air	4CX5000A	Tetrode
17.5 kW	4.20 kW	AB1	0	air	4CX5000R	Tetrode
14.5 kW	4.75 kW	AB1	0	vapor	4CV8000A	Tetrode
13.0 kW	2.50 kW	AB2	113	water	3CW5000A3/F3	Triode
13.0 kW	2.50 kW	AB2	113	air	3CX2500A3/F3	Triode
11.4 kW	3.30 kW	AB1	0	air	4CX3000A	Tetrode
10.0 kW	2.95 kW	AB1	0	water	3CW5000A1/F1	Triode
10.0 kW	2.95 kW	AB1	0	air	3CX3000A1/F1	Triode
3.90 kW	900 W	AB2	4.7	air	4-1000A	Tetrode
3.22 kW	920 W	AB1	0	air	5CX1500A	Pentode
3.20 kW	920 W	AB1	0	air	4CX1500A	Tetrode
1.72 kW	500 W	AB1	0	air	4-500A	Tetrode
1.66 kW	458 W	AB1	0	air	5-500A	Pentode
1.75 kW	400 W	AB2	3.5	air	4-400C	Tetrode
1.42 kW	445 W	AB2	25	air	3-500Z	Triode
1.31 kW	340 W	AB2	26	air	3-400Z	Triode
1.04 kW	190 W	AB2	1.9	air	4-250A	Tetrode
800 W	225 W	AB1	0	air	4CX300A	Tetrode
780 W	350 W	AB1	0	air	8930	Tetrode
600 W	200 W	AB1	0	air	4CX250BC 4CX250F 4X150A 7609	Tetrode
400 W	125 W	AB2	1.0	air	4-125A	Tetrode
270 W	63 W	AB2	1.3	convection	4-65A	Tetrode

SWITCH TUBE OR PULSED REGULATOR SERVICE

Peak Plate Current* (A)	Maximum Hold-off Voltage (kVdc)	Rated Plate Diss.* (kW—W)	Cooling	EIMAC Type Number	Tube Type
780	60	1250 kW	water	8974/X-2159	Tetrode
400	60	650 kW	water	8973/X-2170	Tetrode
300	40	250 kW	water	4CW250,000B	Tetrode
150	130	1000 kW	water	9009/X-2062K	Tetrode
150	100	400 kW	water	9008/X-2062J	Tetrode
150	75	100 kW	water	Y-676A	Tetrode
150	60	35 kW	air	Y-546	Tetrode[1]
150	60	100 kW	water	Y-647	Tetrode[2]
150	40	100 kW	water	4CW100,000D	Tetrode
150	60	100 kW	water	Y-676	Tetrode[3]
150	40	100 kW	water	4CW100,000E	Tetrode
150	40	35 kW	air	4CX35,000C	Tetrode
100	35	50 kW	water	4CW50,000E	Tetrode
100	35	50 kW	vapor	4CV50,000E	Tetrode
70	20	25 kW	water	4CW25,000A	Tetrode
60	20	15 kW	air	4CX15,000A	Tetrode
60	30	15 kW	air	Y-456	Tetrode[4]
50	30	25 kW	water	Y-569	Tetrode[5]
50	15	1.5 kW	air	3CPX1500A7	Triode
40	15	10 kW	air	4CX10,000D	Tetrode
40	20	20 kW	water	3CW20,000A7	Triode
40	15	5 kW	air	4CX5000A	Tetrode
40	15	5 kW	air	4CX5000R	Tetrode
40	25	10 kW	water	Y-442	Tetrode[6]
25	20	3 kW	air	4CX3000A	Tetrode
18	20	60 W	air	4PR60C	Tetrode
15	10	3 kW	air	3CX3000A7/F7	Triode
12	4	600 W	air	4CX600B/F	Tetrode
12	4	800 W	water	4CW800B/F	Tetrode
12	15	750 W	air	8941	Planar Triode
12	8	750 W	air	8942	Planar Triode
12	4	750 W	air	8940	Planar Triode
10	50	1.0 kW	air	8960	Tetrode
10	7	1.5 kW	air	4CX1500A	Tetrode
8	30	1.0 kW	air	4PR1000A	Tetrode
8	40	1.0 kW	air	Y-364	Tetrode[7]
8	7.5 (oil)	600 W	air or oil	8954	Tetrode
6	12	150 W	air	Y-518	Planar Triode
6	7	250 W	air	4CPX250K	Tetrode
6	4	150 W	air	Y-519	Planar Triode
5	12	150 W	air	Y-540	Planar Triode
5	10	150 W	air	8755	Planar Triode
5	4	150 W	air	8847A	Planar Triode
5	3.5	100 W	air	7211	Planar Triode
5	3.5	150 W	air	8757	Planar Triode
5	3.5	100 W	air	8403	Planar Triode
4	50	250 W	air	4PR250C	Tetrode
4	20	400 W	air	4PR400A	Tetrode
3	10	400 W	air	Y-504	Triode[8]
3	4.5	100 W	air	7815RAL	Planar Triode
3	3.5	100 W	air	7815R	Planar Triode
3	3.5	100 W	air	7855	Planar Triode
2.1	18	125 W	air	4PR125A	Tetrode
1.5	4.5	100 W	air	8745	Planar Triode
1.2	15	65 W	convection	4PR65A	Tetrode

[1]Specially processed 4CX35,000C
[2]Specially processed 4CW100,000D
[3]Specially processed 4CW100,000E
[4]Specially processed 4CX15,000A
[5]Prototype 4CW25,000A
[6]Specially processed 4CX5000R
[7]Specially processed 4PR1000A
[8]Specially processed 3-400Z

*Contact EIMAC Application Engineering Department at the appropriate plant for peak pulse ratings.

EIMAC PLANAR TRIODES

EIMAC planar triodes provide greater power, higher efficiency and more reliability than "standard" designs. Many EIMAC planars include internal shielding to reduce degradation effects caused by cathode sublimation. Other types feature a cool cathode to provide long tube life. A broad choice of anodes is available for a wide selection of cooling techniques. High quality and rigid inspection of all planars provide low failure rate and low cost per tube operating hour.

You are not limited by listed planar types. EIMAC's Application Engineering Department is ready to help you design planars into your equipment, or to propose new planar designs to glove-fit your requirements. Write for our planar triode brochure or contact Product Manager, EIMAC division of Varian, 1678 South Pioneer Road, Salt Lake City, Utah 84104.

2C39A, 2C39BA, 2C39WA, 7289

These ceramic/metal planar UHF triodes are usable to 3000 MHz as power amplifiers, oscillators, or frequency multipliers. Narrow mechanical tolerances and exacting electrical testing assure tube-to-tube uniformity.

Of these types, only the 7289 is now recommended for military equipment usage and is specified as the replacement to be listed in older equipments originally supplied with 2C39A and 2C39WA.

The 2C39BA is specially tested for emission and control characteristics, for applications which are unusually sensitive to these parameters.

All the types are identical in appearance and dimensionally the same.

CHARACTERISTICS

Plate Dissipation (Max.)		100 watts
Grid Dissipation (Max.)		2 watts
Frequency for Max. Ratings (CW)		2500 MHz
	(Pulsed)	3000 MHz
Cooling		Forced Air
Cathode		Oxide-coated Unipotential
Heater:	Voltage (2C39A)	6.3 volts
	(remaining types)	6.0 volts
	Current (2C39A)	1.03 amperes
	(remaining types)	1.00 amperes
Capacitances:	Grid-Cathode	6.3 pF
	Grid-Plate	2.01 pF
	Plate-Cathode	0.035 pF
Amplification Factor (Mu)		100
Transconductance (Sm)		25 mmhos
Base		Special, Coaxial
Socket		Special
Maximum Seal & Anode Core Temperature		250°C
Maximum Length:		2.70 in; 68.60 mm
Maximum Diameter:		1.27 in; 32.20 mm
Weight (approximate)		2.5 oz; 71 gm
Operating Position (all types)		Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
C	RF Amplifier or Oscillator at 500 MHz	1000	0.10	900	0.09	—	—	40*
C	RF Amplifier or Oscillator at 2500 MHz	1000	0.10	900	0.09	—	—	17*
C	Plate Modulated RF Amp. or Osc. at 500 MHz	600	0.10	600	0.065	—	—	16*

* Useful Power Output, delivered to the load.

7211, 7698

7211

7698

These ceramic/metal planar UHF triodes feature a large cathode area and a long grid-plate ceramic insulator, resulting in higher current ratings and making them useful in pulse service and high altitude environments. Features are high mu, high transconductance, great mechanical strength, and an arc-resistant extended interface cathode to assure long and reliable life under adverse conditions.

The 7211 and 7698 are identical except for the installation for a 100-watt transverse cooler on the anode of the 7211, while the 7698 carries a knurled-knob assembly on its anode.

CHARACTERISTICS

Plate Dissipation (Max.) (7211)	100 watts
(7698)	10 watts
Grid Dissipation (Max.) (both types)	2 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling (7211)	Forced Air
(7698)	Conduction or Forced Air
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	8.0 pF
Grid-Plate	2.25 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	80
Transconductance (Sm)	30 mmhos
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length: (both types)	2.70 in; 68.60 mm
Maximum Diameter: (7211)	1.27 in; 32.20 mm
(7698)	1.20 in; 30.50 mm
Weight (approximate): (7211)	2.2 oz; 63 gm
(7698)	1.6 oz; 48 gm
Operating Position (both types)	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	RF Amplifier (gnd. grid) at 700 MHz	2500	0.150	630	0.140	—	—	45*
C	RF Oscillator (gnd. grid) at 2500 MHz	2500	0.150	1000	0.140	—	—	30*
C	Grid-pulsed Amp. or Osc. at 1100 MHz	2500	5.0 •	2200	2.5 •	0.002	3	2500†
C	Plate-pulsed Amp. or Osc. at 3000 MHz	3500	5.0 •	3500	4.8 •	0.0025	3	3000†

* Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
•Average during the pulse.

7815, 7815AL, 8745/7815R

7815
7815AL

8745/7815R

These ceramic/metal planar UHF triodes are intended for pulse and high altitude applications. Electrically similar to the 7289, they feature a longer grid-anode ceramic insulator with a higher voltage breakdown rating. Pulse ratings apply to 70,000 feet altitude, making these tubes especially suitable for airborne applications.

The 7815 and 7815AL are identical except for special tests performed on the 7815AL to prove reliability in airline DME and transponder usage. Both have knurled-knob anode assembly.

The 8745/7815R has a 100-watt transverse cooler on the anode, and requires special high-voltage processing and testing.

CHARACTERISTICS

Plate Dissipation (Max.) (7815 & 7815AL) ..... 10 watts
(8745/7851R) ..... 100 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (Pulsed) ..... 3000 MHz
Cooling (7815 & 7815AL) ..... Conduction or Forced Air
(8745/7815R) ..... Forced Air
Cathode ..... Oxide-coated Unipotential
Heater: Voltage (7815AL) ..... 5.7 volts
(remaining types) ..... 6.0 volts
Current (7815AL) ..... 0.95 ampere
(remaining types) ..... 1.00 ampere
Capacitances: Grid-Cathode ..... 6.3 pF
Grid-Plate ..... 1.98 pF
Plate-Cathode ..... 0.025 pF
Amplification Factor (Mu) 100
Transconductance (Sm) ..... 25 mmhos
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: (all types) ..... 2.70 in; 68.60 mm
Maximum Diameter: (7815 & 7815AL) ..... 1.20 in; 30.50 mm
(8745/7815R) ..... 1.27 in; 32.20 mm
Weight (approximate): (7815 & 7815AL) ..... 1.8 oz; 51 gm
(8745/7815R) ..... 2.5 oz; 71 gm
Operating Position (all types) ..... Any

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1100 MHz	2500	3.0 •	2200	1.9 •	0.002	3	2000*
C	Plate-pulsed Amplifier or Oscillator at 3000 MHz	3500	3.0 •	3500	3.0 •	0.0033	6	1600*
FOR TYPE 8745 ONLY								
C	Grid-pulsed Amplifier or Oscillator at 1100 MHz	3500	3.0 •	2200	1.9 •	0.002	3	2000*
C	Plate-pulsed Amplifier or Oscillator at 3000 MHz	4500	3.0 •	3500	3.0 •	0.0025	3	1600*

* Useful Power Output, delivered to the load.
• Average during the pulse.

7855, 7855KAL, Y-503

7855

These ceramic/metal planar UHF triodes feature rugged design, high transconductance, and high mu, a frequency stable anode, and an arc-resistant cathode, all to assure stable operation under adverse conditions and minimize catastrophic failure due to an arc during circuit malfunction.

Test evaluation of the 7855KAL is based on the operating conditions found in commercial airborne applications, such as transponders, emphasizing cathode emission capability at reduced heater voltage and high-voltage holdoff.

The 7855 has a 100-watt transverse cooler, while the 7855KAL includes a knurled-knob anode assembly and is rated for lower plate dissipation.

The Y-503 is a 7855 with a threaded anode shank, to allow conduction, heat-sink, or liquid cooling.

7855KAL

Y-503

CHARACTERISTICS

Plate Dissipation (Max.) (7855) ..... 100 watts
(7855KAL) ..... 10 watts
(Y-503) ..... Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling (7855) ..... Forced Air
(7855KAL) ..... Conduction or Forced Air
(Y-503) ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage (7855 & Y-503) ..... 6.0 volts
(7855KAL) ..... 5.7 volts
Current (7855 & Y-503) ..... 1.0 ampere
(7855KAL) ..... 0.95 ampere
Capacitances: Grid-Cathode ..... 6.8 pF
Grid-Plate ..... 2.5 pF
Plate-Cathode ..... 0.035 pF
Amplification Factor (Mu) 80
Transconductance (Sm) ..... 25 mmhos
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: (7855 & 7855KAL) ..... 2.40 in; 60.96 mm
(Y-503) ..... 1.81 in; 45.97 mm
Maximum Diameter: (7855) ..... 1.27 in; 32.20 mm
(7855KAL) ..... 1.20 in; 30.50 mm
(Y-503) ..... 0.79 in; 20.00 mm
Weight (approximate): (7855) ..... 2.0 oz; 57 gm
(7855KAL) ..... 1.4 oz; 40 gm
(Y-503) ..... 0.65 oz; 18 gm
Operating Position (all types) ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1100 MHz	2500	3.0 •	2000	1.3 •	0.001	0.5	750*
C	Plate-pulsed Amplifier or Oscillator	3500	3.0 •	—	—	—	—	—

* Useful Power Output, delivered to the load.
• Average during the pulse.

8403

The 8403 is a rugged, high-mu planar triode of ceramic/metal construction, for use as a grid-pulsed, plate-pulsed, or CW oscillator, frequency multiplier, or amplifier up to 3000 MHz.

The tube incorporates a frequency-stable anode and a cathode designed for high current capability.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 100 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 2000 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 8.0 pF
Grid-Plate ..... 3.1 pF
Plate-Cathode ..... 0.065 pF
Amplification Factor (Mu) 80
Transconductance (Sm) ..... 30 mmhos
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.39 in; 60.60 mm
Maximum Diameter: ..... 1.27 in; 32.20 mm
Weight (approximate) ..... 2.0 oz; 57 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier or Oscillator at 2500 MHz	2500	0.150	900	0.140	—	—	25*
C	Grid-pulsed Amplifier or Oscillator at 1090 MHz	2500	5.0 •	2000	4.0 •	0.005	0.5	1000†
C	Plate-pulsed Amplifier or Oscillator at 3000 MHz	3000	5.0 •	3500	5.0 •	0.0025	3	2000†

* Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8533

The 8533 is a planar triode designed for use as a grid or plate pulsed oscillator, amplifier, frequency multiplier, or switch tube at high plate voltage.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 100 watts
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (Pulsed) ..... 3000 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 8.0 pF
Grid-Plate ..... 1.65 pF
Plate-Cathode ..... 0.06 pF
Amplification Factor (Mu) 145
Nominal Cutoff Amp. Factor (Mu) 90
Transconductance (Sm) ..... 30 mmhos
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.70 in; 68.60 mm
Maximum Diameter: ..... 1.27 in; 32.20 mm
Weight (approximate) ..... 2.2 oz; 63 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1030 MHz	8,000	5.0 •	8000	5.0 •	0.0033	1	15,000†
C	Plate-pulsed Amplifier or Oscillator	10,000	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	8,000	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.
•Average during the pulse.

8755

The 8755 is a miniature ceramic/metal rugged planar triode for advanced airborne and space applications up to 3000 MHz.

The tube is intended for use as an amplifier, oscillator, or frequency multiplier, either grid or plate-pulsed, and may also be used in modulator or regulator service. It has a frequency-stable anode design and an arc-resistant cathode to assure stable and reliable life under adverse conditions.

The tube is supplied without radiator, and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting up to 150 watts of dissipation, are available.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 9.5 pF
Grid-Plate ..... 1.05 pF
Plate-Cathode ..... 0.06 pF
Amplification Factor (Mu) 135
Nominal Cutoff Amp. Factor (Mu) 90
Transconductance (Sm) ..... 30 mmhos
Anode .....Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.37 in; 34.80 mm
Maximum Diameter: ..... 0.785 in; 19.94 mm
Weight (approximate) ..... 0.56 oz; 16 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator	8,000	5.0 •	1750	1.0 •	0.001	3.5	650†
C	Plate-pulsed Amplifier or Oscillator	10,000	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	8,000	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8757

The 8757 is a miniature, frequency-stable, ceramic/metal, rugged planar triode for advanced airborne and space applications up to 3500 MHz.

It may be used as an amplifier, oscillator, or frequency multiplier in the CW, grid or plate pulsed mode, as well as a modulator or regulator.

The tube has an anode designed to produce exceptional frequency stability, and an arc-resistant cathode, both assuring stable, reliable, and long-life operation under adverse conditions.

The 8757 is supplied without radiator and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting an anode dissipation up to 150 watts, are available.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (CW) ..... 3000 MHz
(Pulsed) ..... 3500 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 9.0 pF
Grid-Plate ..... 1.65 pF
Plate-Cathode ..... 0.04 pF
Amplification Factor (Mu) 75
Nominal Cutoff Amp. Factor (Mu) 60
Transconductance (Sm) ..... 30 mmhos
Anode .....Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base ..... Special, Coaxial
Socket ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.30 in; 33.00 mm
Maximum Diameter: ..... 0.785 in; 19.94 mm
Weight (approximate) ..... 0.56 oz; 16 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.250	—	—	—	—	—
C	Grid-pulsed Amplifier or Oscillator at 3500 MHz	3000	5.0 •	2500	5.0 •	0.0033	1.0	3000†
C	Plate-pulsed Amplifier or Oscillator	3500	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	3500	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8847A

The 8847A is a miniature, ceramic/metal, rugged planar triode for advanced airborne and space applications up to 3500 MHz.

The tube is supplied without radiator and may be conduction, convection, heat-sink, or liquid cooled. Radiators permitting forced-air cooling with up to 150 watts of anode dissipation are available.

The tube is a frequency-stable anode design and has an arc-resistant cathode, for stable, reliable, and long-life operation under adverse conditions. It may be used as an amplifier, oscillator, or frequency multiplier, in the CW mode, or grid or plate pulsed, as well as a modulator or regulator.

CHARACTERISTICS

Plate Dissipation (Max.) . . Dependent on Cooling Technique
Grid Dissipation (Max.) . . . . . 1.5 watts
Frequency for Max. Ratings (CW) . . . . . 3000M MHz
(Pulsed) . . . . . 3500 MHz
Cooling . . . . . Technique Optional
Cathode . . . . . Oxide-coated Unipotential
Heater: Voltage . . . . . 6.0 volts
Current . . . . . 0.95 ampere
Capacitances: Grid-Cathode . . . . . 9.5 pF
Grid-Plate . . . . . 1.4 pF
Plate-Cathode . . . . . 0.06 pF
Amplification Factor (Mu) 75
Nominal Cutoff Amp. Factor (Mu) 60
Transconductance (Sm) . . . . . 30 mmhos
Anode . . . . . Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base . . . . . Special, Coaxial
Maximum Seal & Anode Core Temperature . . . . . 250°C
Maximum Length: . . . . . 1.37 in; 34.80 mm
Maximum Diameter: . . . . . 0.785 in; 19.94 mm
Weight (approximate) . . . . . 0.56 oz; 16 gm
Operating Position . . . . . Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.250	—	—	—	—	—
C	Grid-pulsed Amplifier or Oscillator at 1600 MHz	3000	5.0 •	3000	3.0 •	0.0033	6	3000†
C	Plate-pulsed Amplifier or Oscillator	3500	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	3500	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8906, 8906AL

These rugged, ceramic/metal planar triodes are designed for use as a grid or plate-pulsed oscillator, amplifier, or frequency multiplier up to 3000 MHz, as well as for pulse modulator or voltage-regulator service.

The 8906 and 8906AL are electrically identical, except for special tests performed on the AL version to prove reliability in airline DME and transponder service.

These tubes have unusually low heater power requirements for their high current capability. They normally can be used to replace types 7815 or 7815R, at the same heater voltage, where higher current capability and/or longer life are required. They can normally also replace types 7211 and 7698 when a 25% lower heater power requirement is desired.

The cathode of these tubes is of the arc-resistant, extended-interface type, well proven for reliable, long-life operation under adverse conditions.

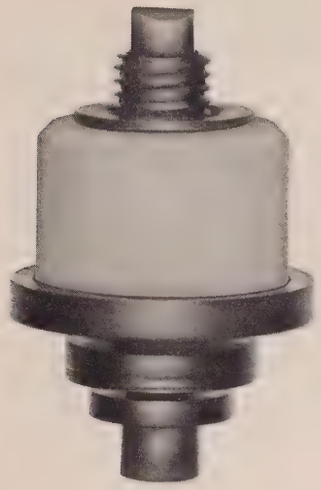
CHARACTERISTICS

Plate Dissipation (Max.) . . . . . 10 watts
Grid Dissipation (Max.) . . . . . 1.5 watts
Frequency for Max. Ratings (CW) . . . . . 2500 MHz
(Pulsed) . . . . . 3000 MHz
Cooling . . . . . Conduction or Forced Air
Cathode . . . . . Oxide-coated Unipotential
Heater: Voltage (8906) . . . . . 6.0 volts
(8906AL) . . . . . 5.7 volts
Current (8906) . . . . . 1.0 ampere
(8906AL) . . . . . 0.95 ampere
Capacitances: Grid-Cathode . . . . . 8.0 pF
Grid-Plate . . . . . 1.98 pF
Plate-Cathode . . . . . 0.06 pF
Amplification Factor (Mu) 80
Nominal Cutoff Amp. Factor (Mu) 60
Transconductance . . . . . 30 mmhos
Base . . . . . Special, Coaxial
Socket . . . . . Special
Maximum Seal & Anode Core Temperature . . . . . 250°C
Maximum Length: . . . . . 2.70 in; 68.60 mm
Maximum Diameter: . . . . . 1.20 in; 30.50 mm
Weight (approximate) . . . . . 1.8 oz; 48 gm
Operating Position . . . . . Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier (gnd. grid) at 700 MHz	2500	0.15	630	0.14	—	—	45*
C	RF Amplifier (gnd. grid) at 2500 MHz	2500	0.15	1000	0.14	—	—	30*
C	Grid-pulsed Amplifier at 1100 MHz	3500	5.0 •	2200	2.5 •	0.002	3	2500†
C	Plate-pulsed Oscillator at 3000 MHz	4500	5.0 •	3500	4.8 •	0.0025	3	3000†
—	Switch Tube or Pulse Modulator	3500	5.0 •	—	—	—	—	—

* Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8933/8538B



The 8933/8538B is a miniature, ceramic/metal, rugged planar triode for advanced airborne and space applications up to 3000 MHz where high RF pulse power is required, or for switch tube service up to 8 kVdc.

In addition to low inter-electrode capacitance, high transconductance and amplification factor, the 8933/8938B has an arc-resistant cathode and a spewing shield, assuring stable, reliable long-life operation under adverse conditions.

The 8933/8538B is supplied without radiator and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting an anode dissipation up to 150 watts, are available.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 9.5 pF
Grid-Plate ..... 1.4 pF
Plate-Cathode ..... 0.06 pF
Amplification Factor (Mu) 120
Transconductance (Sm) ..... 30 mmhos
Anode ..... Threaded stud,
5/16-24 UNF-2A thread for heat transfer;
Concentric flange for electrical contact.
Base ..... Special, Coaxial
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.50 in; 38.10 mm
Maximum Diameter: ..... 0.95 in; 24.13 mm
Weight (approximate) ..... 0.7 oz; 19 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1030 MHz	8000	5.0 •	5000	3.3 •	0.0033	0.5	8000†
C	Grid-pulsed Amplifier or Oscillator at 1030 MHz	8000	5.0 •	4700	1.5 •	0.0033	0.5	3250‡
C	Plate-pulsed Amplifier or Oscillator	10,000	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	8000	5.0 •	—	—	—	—	—

†Useful Pulse Power, delivered to the load. Approximate stage gain = 6dB.
‡ Useful Pulse Power, delivered to the load. Approximate stage gain = 10 dB.
• Average during the pulse.

8940

The 8940 is a planar triode for advanced airborne, ground, and space applications up to 2500 MHz.

The tube may be used as an amplifier, oscillator, or frequency multiplier, in the grid or plate pulsed mode, as well as a modulator or series regulator tube.

The 8940 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooled, such as immersion cooling in an insulating medium (e.g. FC-75). Radiators for forced-air cooling, as well as heat-sink adaptors, permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 2.0 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 2.25 amperes
Capacitances: Grid-Cathode ..... 16.0 pF
Grid-Plate ..... 3.8 pF
Plate-Cathode ..... 0.11 pF
Amplification Factor (Mu) 65
Transconductance (Sm) ..... 100 mmhos
Anode ..... Threaded stud,
1/2-20 UNF for heat transfer;
Tapered flange for electrical contact.
Grid, Cathode/Heater Contacts ..... Special, Coaxial
Heater Contact ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.98 in; 50.29 mm
Maximum Diameter: ..... 1.37 in; 34.80 mm
Weight (approximate) ..... 2.0 oz; 56 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Duty	TYPICAL OPERATION Pulse Length (μs)	TYPICAL OPERATION Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1200 MHz	4000	12 •	4000	3.0 •	0.01	500	6,000†
C	Plate-pulsed Amplifier or Oscillator at 2000 MHz	6500	12 •	3500	10.0 •	0.0033	6	10,000†
A,B, or C	RF Amplifier or Oscillator at 800 MHz	4000	0.6	1400	0.32	—	—	180*
—	Switch Tube or Pulse Modulator	4000	12 •	—	—	0.0033	6	—

* Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

8941

The 8941 is a planar triode for advanced airborne, ground, and space applications.

The tube is intended primarily as a modulator or series regulator tube, and can be used also in grid or plate pulsed RF applications.

The 8941 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooling, such as immersion cooling in an insulating medium (e.g., FC-75). Radiators for forced-air cooling, as well as heat-sink adaptors, permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.) .... Depends on Cooling Technique
Grid Dissipation (Max.) ..... 2.0 watts
Frequency for Max. Ratings (Pulsed) ..... 2000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 2.25 amperes
Capacitances: Grid-Cathode ..... 14.0 pF
Grid-Plate ..... 2.5 pF
Plate-Cathode ..... 0.11 pF
Amplification Factor (Mu) 200
Transconductance (Sm) ..... 75 mmhos
Anode .....Threaded stud, 1/2-20 UNF for heat transfer; Tapered flange for electrical contact.
Grid, Cathode/Heater contacts ..... Special, Coaxial
Heater Contact ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.23 in; 56.64 mm
Maximum Diameter: ..... 1.36 in; 34.54 mm
Weight (approximate) ..... 2 0 oz; 56 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)•	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
B or C	Grid-pulsed Amplifier or Oscillator at 1090 MHz	10,000	12•	5000	4.0	0.001	3.0	10,000†
B or C	Plate-pulsed Amplifier or Oscillator	15,000	12•	—	—	—	—	—
—	Switch Tube or Pulse Modulator	15,000	12•	—	—	—	—	—

• Average during the pulse
† Useful Pulse Power, delivered to the load.

8942

The 8942 is a planar triode for advanced airborne, ground, and space applications up to 2000 MHz.

The tube may be used as an amplifier, oscillator, or frequency multiplier, in the grid or plate pulsed mode, as well as a modulator or series regulator tube.

The 8942 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooled, such as immersion cooling in an insulating medium (e.g., FC-75). Radiators for forced-air cooling as well as heat-sink adaptors permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 2.0 watts
Frequency for Max. Ratings (Pulsed) ..... 2000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 2.25 amperes
Capacitances: Grid-Cathode ..... 15.0 pF
Grid-Plate ..... 3.0 pF
Plate-Cathode ..... 0.11 pF
Amplification Factor (Mu) 115
Transconductance (Sm) ..... 90 mmhos
Anode .....Threaded stud, 1/2-20 UNF for heat transfer; Tapered flange for electrical contact.
Grid, Cathode/Heater contacts ..... Special, Coaxial
Heater Contact ..... Special
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.23 in; 56.64 mm
Maximum Diameter: ..... 1.36 in; 34.54 mm
Weight (approximate) ..... 2.0 oz; 56 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)•	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
C	Gird-pulsed Amplifier or Oscillator	6000	12•	—	—	—	—	—
C	Plate-pulsed Amplifier or Oscillator at 1300 MHz	7500	12•	7500	12	0.001	1.0	30,000†
—	Switch Tube or Pulse Modulator	8000	12•	—	—	—	—	—

† Useful Pulse Power, delivered to the load.
• Average during the pulse.

Y-518

The Y-518 is a miniature planar triode for advanced airborne, ground, and space applications up to 3000 MHz.

The Y-518 may be used as an amplifier, oscillator, or frequency multiplier in the CW mode, grid or plate pulsed mode, or as a modulator or regulator.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 9.7 pF
Grid-Plate ..... 1.2 pF
Plate-Cathode ..... 0.065 pF
Amplification Factor (Mu) 135
Transconductance (Sm) ..... 40 mmhos
Anode ..... Threaded stud, 3/8-24 UNF, for heat transfer; Tapered flange for electrical contact.
Base ..... Special, Coaxial
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.37 in; 34.80 mm
Maximum Diameter: ..... 0.785 in; 19.90 mm
Weight (approximate) ..... 0.56 oz; 16 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	RF Amplifier or Oscillator	7500	0.3	—	—	—	—	—
C	Grid-pulsed Amplifier or Oscillator at 1100 MHz	8000	6.0•	4000	1.8•	0.001	12	2500†
C	Plate-pulsed Amplifier or Oscillator	10,000	6.0•	—	—	—	—	—
—	Switch Tube or Pulse Modulator	10,000	6.0•	—	—	—	—	—

* Cathode current
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

Y-519

The Y-519 is a planar triode for advanced airborne and space applications up to 3000 MHz.

The Y-519 may be used as an amplifier, oscillator, or frequency multiplier in the CW, grid or plate pulsed mode, as well as a modulator or series regulator tube.

CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Grid Dissipation (Max.) ..... 1.5 watts
Frequency for Max. Ratings (CW) ..... 2500 MHz
(Pulsed) ..... 3000 MHz
Cooling ..... Technique Optional
Cathode ..... Oxide-coated Unipotential
Heater: Voltage ..... 6.3 volts
Current ..... 1.3 amperes
Capacitances: Grid-Cathode ..... 9.75 pF
Grid-Plate ..... 1.70 pF
Plate-Cathode ..... 0.065 pF
Amplification Factor (Mu) 75
Transconductance (Sm) ..... 40 mmhos
Anode ..... Threaded stud, 3/8-24 UNF-2A for heat transfer; Tapered flange for electrical contact.
Base ..... Special, Coaxial
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 1.37 in; 34.80 mm
Maximum Diameter: ..... 0.78 in; 19.90 mm
Weight (approximate) ..... 0.56 oz; 16 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	RF Amplifier or Oscillator	3000	0.3	1800	0.2	—	—	80*
C	Grid-pulsed Amplifier or Oscillator	3000	6.0•	3000	3.0•	0.0033	200	3500†
C	Plate-pulsed Amplifier or Oscillator	3500	6.0•	—	—	—	—	—
—	Switch Tube or Pulse modulator	3000	6.0•	—	—	—	—	—

* Useful Power Output, delivered to the load
† Useful Pulse Power, delivered to the load
• Average during the pulse

Y-540

The Y-540 is a rugged planar triode designed for switch tube or pulsed regulator service in advanced ground, airborne, or space applications.

Design features include an arc-resistant cathode to assure stable and reliable long-life operation under adverse conditions. An added feature is the increased grid-to-cathode insulator length to permit operation at high plate voltages and/or higher altitudes.

The Y-540 is normally supplied without a radiator and may be conduction, convection, heat-sink, or liquid cooled, as immersion cooling in an insulating medium (e.g., FC-75). Radiators for forced-air cooling, as well as heat-sink adaptors, permitting anode dissipation up to 150 watts, are available. The tube is supplied with solder tabs on the cathode, heater, and grid terminals.

CHARACTERISTICS

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	1.5 watts
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	9.0 pF
Grid-Plate	1.4 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	145
Transconductance (Sm)	30 mmhos
Anode	Threaded stud, 5/16-24 UNF-2A for heat transfer and electrical contact.
Grid, Cathode, Heater Contacts	Special, Solder Tabs
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.56 in; 39.60 mm
Maximum Diameter:	0.78 in; 19.90 mm
Weight (approximate)	0.56 oz; 16 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)*	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Duty	TYPICAL OPERATION: Pulse Length (μs)	TYPICAL OPERATION: Output Power (watts)
—	Switch Tube or Pulse Modulator	8000	5.0	—	—	—	—	—

* Peak current.

Y-579

The Y-579 is a rugged ceramic/metal planar triode designed to deliver 15 dB peak sync power gain in UHF TV translator service. The tube may also be used in CW mixer, oscillator, or amplifier service. The Y-579 is supplied with an air-cooling radiator for forced-air cooling.

The Y-579 has a specially designed dispenser-type cathode which permits the high average current ratings needed in TV translator service and which is particularly insensitive to back heating.

CHARACTERISTICS

Plate Dissipation (Max.)	150 watts
Grid Dissipation (Max.)	1.5 watts
Frequency for Max. Ratings (CW)	2500 MHz
Cooling	Forced Air
Cathode	Dispenser Type
Heater: Voltage	6.0 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	6.5 pF
Grid-Plate	2.0 pF
Plate-Cathode	0.035 pF
Amplification Factor	100
Transconductance	25 mmhos
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.70 in; 68.60 mm
Maximum Diameter:	1.27 in; 32.20 mm
Weight (approximate)	2.2 oz; 63 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Drive Power (watts)	TYPICAL OPERATION: Output Power (watts)
C	RF Amplifier or Oscillator	2500	.40	—	—	—	—
A	UHF TV Translator Amplifier	2500	.40	1300	.09	3.2	100*

*Peak Sync. level

Y-579 A

The Y-579A is a high-gain (up to 20 dB) version of the basic Y-579. It is a rugged ceramic/metal planar triode designed to deliver 20 dB peak sync power gain in UHF TV translator service. The tube may also be used in CW oscillator or mixer and amplifier service.

The Y-579A has higher Mu and transconductance than the Y-579, and includes the specially designed dispenser-type cathode which permits the high average current ratings needed in TV translator service and which is particularly insensitive to back heating. The high Mu and Sm make this tube ideally suited for applications where high gain is required; gain in excess of 18 dB may be expected with suitable cavity design.

CHARACTERISTICS

Plate Dissipation (Max.)	150 watts
Grid Dissipation (Max.)	1.5 watts
Frequency for Max. Ratings (CW)	3000 MHz
Cooling	Forced Air
Cathode	Dispenser Type
Heater: Voltage	6.0 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	7.0 pF
Grid-Plate	2.0 pF
Plate-Cathode	0.035 pF
Amplification Factor (Mu)	200
Transconductance (Sm)	30 mmhos
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.70 in; 68.60 mm
Maximum Diameter:	1.26 in; 32.20 mm
Weight (approximate)	2.2 oz; 63 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.40	—	—	—	—
A	UHF TV Translator Amplifier	2500	0.40	1300	.09	1*	100*

*Peak Sync. level.

Y-667

The Y-667 is a high plate dissipation triode especially suited for UHF-TV translator service. This tube is also useful as a CW oscillator or amplifier.

CHARACTERISTICS

Plate Dissipation	150 watts
Grid Dissipation	2 watts
Frequency for Max. Ratings (CW)	2500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	8.0 pF
Grid-Plate	2.25 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	80
Transconductance (Sm)	30 mmhos
Base	Special Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.70 in.; 68.6 mm
Maximum Diameter:	1.27 in.; 32.2 mm
Weight (approximate)	2.2 oz.; 63 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.15	—	—	—	—
A	UHF TV Translator Amplifier	2500	0.15	1800	0.09	3*	100*

*Peak Sync. level.

X-2172 F

The X-2172F is a high voltage switching tube designed especially for short pulsed (nanosecond) applications. It can also be used in series or shunt regulators where high voltage and low current are required in addition to fast switching.

CHARACTERISTICS

Plate Dissipation (Max.)	300 watts
Grid Dissipation (Max.)	2 watts
Cooling	Optional, Oil or Forced Air
Filament:	
Voltage	6.3 volts
Current	2.25 amperes
Capacitances (Gnd. Cath. Connection	
Input	17 pF
Output	.04 pF
Feed-through	2.5 pF
Amplification Factor	675
Base	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.25 in; 64.9 mm
Maximum Diameter:	1.3 in; 33 mm
Weight (approximate)	4.6 oz; .13 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)*	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
—	Modulator or Series Regulator	25 kV	12	—	—	—	—

*Peak current.

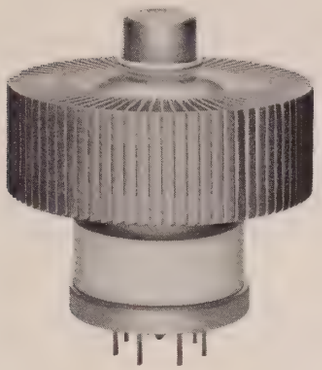
EIMAC HIGH PERFORMANCE FOCUSED TRIODES

This new series of focused triodes is designed specifically for operation in the UHF spectrum. The triodes are designed with beam-forming cathode and control grid geometry. This beam-focusing feature provides high gain and low grid interception. These triodes eliminate many of the cavity and equipment design complications associated with tetrodes. Performance is equal or superior to equivalent tetrodes.

For convenience, the series of new tube types is listed at right. The page number of the catalog is referenced where additional information may be found on each type. For additional information contact Product Manager, Varian, EIMAC division, 301 Industrial Way, San Carlos, CA 94070. Phone (415)-592-1221.

Type Number	Plate Dissipation (watts)	F (max) CW	Catalog Page
3CX400U7 / 8961	400	1000	27
3CX600U7	600	1000	28
8938	1500	500	41
8962	1500	1000	41
3CX10,000U7	10,000	90	36

3CPX1500A7



The 3CPX1500A7 is a rugged high-mu power triode, designed with beam-forming cathode and control-grid geometry to allow the simplicity of design and circuit advantages of a triode with the gain of a tetrode.

The tube is intended for pulse modulator or pulse regulator service. The external anode may be forced-air cooled, or for higher voltage holdoff capability the complete tube may be liquid immersed for both insulation improvement and cooling

This tube may be used in grid or plate pulsed RF application where higher peak power is required.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 watts
Grid Dissipation (Max.)	25 watts
Cooling	Liquid Immersion or Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5.5 volts
Current	11.2 amperes
Capacitances (Gnd. Cath. Connection)	
Input	38.5 pF
Output (Max.)	0.2 pF
Feed-through	10.2 pF
Transconductance	55,000 μmhos
Amplification Factor	200
Base	Special, 7-pin
Recommended Air System Socket	SK-2200
Recommended Air Chimney	SK-2216
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.02 in; 102.00 mm
Maximum Diameter:	3.38 in: 86.00 mm
Weight (approximate)	26.02 oz; 0.735 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (kV)	MAXIMUM RATINGS Plate Current (amps)*	TYPICAL OPERATION Plate Voltage (kV)	TYPICAL OPERATION Plate Current (amps)*	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (kW)
Forced Air	Grid Driven Pulse Regulator or Modulator	10.0	50.0	10.0	40.0	700	306†
Liquid immersed	Grid Driven Pulse Regulator or Modulator	15.0	50.0†	15.0	40.0	735	506†

†t_p = 10 μsec, see pulse rating curve for longer pulse.
*Peak value

3CX400U7/8961

The 3CX400U7/8961 is a high-mu power triode designed for use above 200 MHz as a CW, pulse, or linear RF amplifier, particularly in the 806 to 1000 MHz portion of the spectrum allocated to land mobile service. The tube is designed with beam-forming cathode and control-grid geometry, and has an anode rating of 400 watts.

With an amplification factor of over 200 and minimum current interception by the grid the tube has excellent power gain in cathode-driven circuitry. Over 200 watts of useful CW RF power may be obtained with better than 33% efficiency and better than 10 dB of gain in the UHF region.

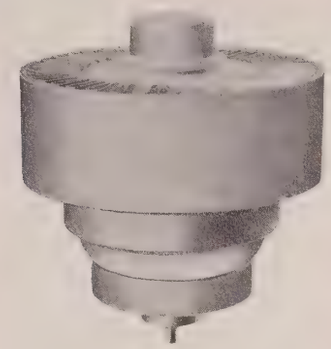
CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	1000 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.3 volts
Current	3.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	18.4 pF
Output	6.1 pF
Feed-through	0.07 pF
Amplification Factor	240
Transconductance	29,000 μmhos
Base	Special, Coaxial
Recommended Air System Socket	Special: Collets Available
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.50 in; 63.70 mm
Maximum Diameter:	2.10 in; 52.90 mm
Weight (approximate)	5.5 oz; 155 gm.
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	Cathode Driven RF Amplifier at 850 MHz	1500	0.4	1500	0.4	13	225†

†Useful Power Output

3CX600U7



The 3CX600U7 is a high-mu power triode designed for use above 200 MHz as a CW, pulse, or linear RF amplifier. This high-mu triode is designed with beam-forming cathode and control grid geometry. It has an anode rating of 600 watts.

The combination of an amplification factor over 200 and minimum current interception by the control grid provides good power gain in cathode-driven amplifiers. Coaxial terminals and continuous cone-shaped conductors for the grid and cathode allow the lowest possible inductance between these tube elements and the cavity.

380 watts of useful CW RF power may be obtained with better than 40% efficiency, and better than 14 dB of gain, at 775 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	600 watts
Grid Dissipation (Max.)	6 watts
Frequency for Max. Ratings (CW)	1000 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage (See UHF Derating Curve on data sheet)	6.0 volts
Current	5.4 amperes
Capacitances (Gnd. Grid Connection)	
Input	26.6 pF
Output	9.2 pF
Feed-through	.11 pF
Amplification Factor	200
Base	Special Coaxial
Recommended Air System Socket	Special; collets available
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.33 in; 59.2 mm
Maximum Diameter:	2.08 in; 52.8 mm
Net Weight (approximate)	7.7 oz. .2 kg.
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	Cathode Driven RF Amplifier	2000	0.6	1500*	0.6	12	383*

*Measured data @800 MHz

3CX1000A7/8283

The 3CX1000A7/8283 high-mu triode is intended for Class AB_2 linear amplifier service in either grid-driven or cathode-driven configuration. It is recommended for use as a grid-driven push-pull audio amplifier or modulator and as a cathode driven linear amplifier through the VHF-TV bands.

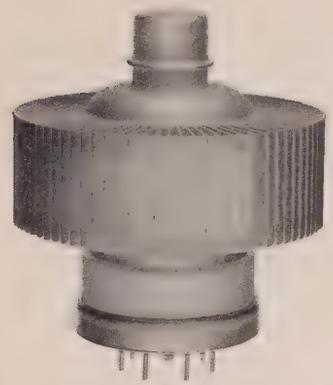
CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Grid Dissipation (Max.)	45 watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	30.5 amperes
Capacitances (Gnd. Cath. Connection)	
Input	32.0 pF
Output	0.15 pF
Feed-through	14.0 pF
Capacitances (Gnd. Grid Connection):	
Input	32.0 pF
Output	14.0 pF
Feed-through	0.15 pF
Amplification Factor	200
Base	Special, breechblock
Recommended Air System Socket	SK-860 or SK-870
Recommended Air Chimney	SK-816
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.80 in; 121.90 mm
Maximum Diameter:	3.38 in; 85.80 mm
Weight (approximate)	2.0 lb; 0.91 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	Grid Driven RF Amplifier	3500	0.7.	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	2000	0.55	—	—	—	—
AB_2	Cathode Driven RF Linear Amplifier	3500	1.0	3500	0.86	100	2060
AB_2	Grid Driven AF Amplifier or Modulator	3500	1.0	2500	2.0*	44	3100*

*Two tubes

3CX1500A7/8877



The 3CX1500A7/8877 power triode is designed for use as a cathode-driven Class AB_2 or Class B amplifier, in audio or RF applications including the VHF band or as a cathode driven plate modulated Class C RF amplifier. As a linear amplifier, high power gain may be obtained without sacrifice of low intermodulation distortion characteristics. Low grid interception and high amplification factor combine to make drive requirements exceptionally low for a tube of this power capacity.

CHARACTERISTICS

Plate Dissipation ..... 1500 watts
Grid Dissipation ..... 25 watts
Frequency for Max. Ratings (CW) ..... 250 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 5.0 volts
  Current ..... 10.5 amperes
Capacitances (Gnd. Cath. connection):
  Input ..... 38.5 pF
  Output ..... 0.1 pF
  Feed-through ..... 10.2 pF
Capacitances (Gnd. Grid. Connection):
  Input ..... 38.5 pF
  Output ..... 10.2 pF
  Feed-through ..... 0.1 pF
Amplification Factor 200
Transconductance ..... 55,000 μmhos
Base ..... Special 7-pin
Recommended Air System Socket:
  Grounded Grid SK-2210
  Grounded Cathode SK-2200
Recommended Air Chimney SK-2216
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.02 in; 102.20 mm
Maximum Diameter: ..... 3.38 in; 85.80 mm
Weight (approximate) ..... 1.6 lb; 0.7 kg
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier Plate Modulated at 30 MHz	3200	0.80	2400	0.60	41	1000
B	Cathode Driven RF Linear Amplifier at 108 MHz	4000	1.0	4000	1.0	78	2600†
AB_2	Cathode Driven RF Linear Amplifier at 220 MHz	4000	1.0	2500	1.0	57	1520†
AB_2	Cathode Driven RF Linear Amplifier at 30 MHz	4000	1.0	3500	1.0	64	2075†

†Useful Power Output.

3CX2500A3/8161, 3CX2500F3/8251, 3CX2500H3

3CX2500A3/8161

The 3CX2500A3/8161 high power triode is widely employed in AM, FM, and TV service. Its coaxial filament and grid terminals insure low-inductance connection to these electrodes and allow operation at maximum ratings through 110 MHz. The use of an external forced-air-cooled anode results in a compact structure with high power-handling capability.

The 3CX2500F3/8251 is identical except for the addition of flexible filament and grid leads on the base which can simplify low frequency installations.

The 3CX2500H3 is designed primarily for use in industrial RF heating services.

3CX2500F3/8251

3CX2500H3

CHARACTERISTICS

Plate Dissipation (Max.) ..... 4000 watts
Grid Dissipation (Max.) 150
Frequency for Max. Ratings (CW)
(3CX2500A3/8161) ..... 110 MHz
3CX2500F3/8251 & 3CX2500H3 ..... 75 MHz
Cooling ..... Forced Air
Filament .....Thoriated Tungsten
Voltage .....7.5 volts
Current (all types) ..... 51.5 amperes
Capacitances (Gnd. Cath. Connection):
Input ..... 35.0 pF
Output ..... 0.9 pF
Feed-through ..... 20.0 pF
Amplification Factor 20
Transconductance ..... 20,000 μmhos
Base (3CX2500A3/8161) ..... Coaxial
(3CX2500F3/8251, 3CX2500H3) ..... Flexible Leads
Maximum Length:
(3CX2500A3/8161 ..... 9.00 in; 228.60 mm
3CX2500F3/8251, 3CX2500H3 ..... 18.44 in; 468.40 mm
Maximum Diameter: (all types) ..... 4.16 in; 105.70 mm
Weight (approximate): (3CX2500A3/8161) ..... 6.2 lb; 2.8 kg
3CX2500F3/8251, 3CX2500H3) ..... 7.5 lb; 3.4 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier Plate Modulated	5500	2.0	5000	1.3	115	5,300
AB	Grid Driven AF Amplifier or Modulator	6000	2.5	6000	3.0*	113	13,000*

*Two tubes

3CX3000A1/8238, 3CX3000F1/8239

3CX3000A1/8238

The 3CX3000A1/8238 low-mu power triode is forced-air cooled and is intended for use as an audio amplifier or modulator. Available high plate current under Class AB_1 operating conditions permits high power gain with a minimum of distortion. The tube is coaxial in construction.

The 3CX3000F1/8239 is identical except for the addition of flexible filament and grid leads on the base which can simplify some installations.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 4000 watts
Grid Dissipation (Max.) ..... 50 watts
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 51.5 amperes
Amplification Factor 5.0
Transconductance ..... 11,000 μmhos
Base (3CX3000A1/8238) ..... Coaxial
  (3CX3000F1/8239) ..... Flexible leads
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length:
  (3CX3000A1/8238) ..... 9.00 in; 228.60 mm
  (3CX3000F1/8239) ..... 18.44 in; 464.40 mm
Maximum Diameter: (both types) ..... 4.16 in; 105.70 mm
Weight (approximate): (3CX3000A1/8238 ..... 6.2 lb; 2.8 kg
  (3CX3000F1/8239) ..... 7.5 lb; 3.4 kg
Operating Position ..... Vertical, base up or down

3CX3000F1 8239

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Grid Driven AF Amplifier or Modulator	6000	2.5	5500	2.2*	0	8250*

*Two tubes.

3CX3000A7, 3CX3000F7/8162

3CX3000A7

The 3CX3000A7 high-mu forced-air cooled power triode provides relatively high power output as an amplifier, oscillator, or modulator at low plate voltages. The tube has a low inductance cylindrical filament-stem structure which readily becomes part of a linear filament tank circuit for VHF operation.

Operation with zero grid bias in many applications offers circuit simplicity by eliminating the bias supply. Grounded-grid operation is attractive since a power gain of over twenty times can be obtained.

The 3CX3000F7/8162 tube is identical except for the addition of flexible leads on the base for grid and filament connections which can simplify socketing in low frequency applications.

3CX3000F7/8162

CHARACTERISTICS

Plate Dissipation (Max.) ..... 4000 watts
Grid Dissipation (Max.) ..... 225 watts
Frequency for Max. Ratings (CW)
  3CX3000A7 ..... 110 MHz
  3CX3000F7/8162 ..... 75 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current:
    (3CX3000A7) ..... 51.5 amperes
    (3CX3000F7/8162) ..... 50.5 amperes
Capacitances (Gnd. Cath. connection):
  Input ..... 38.0 pF
  Output ..... 0.6 pF
  Feed-through ..... 24.0 pF
Capacitances (Gnd. Grid. Connection):
  Input ..... 38.0 pF
  Output ..... 24.0 pF
  Feed-through ..... 0.6 pF
Amplification Factor 160
Base (3CX3000A7) ..... Special, coaxial
  (3CX3000F7/8162) ..... Flexible leads
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length:
  (3CX3000A7) ..... 9.00 in; 228.60 mm
  (3CX3000F7/8162) ..... 18.44 in; 468.40 mm
Maximum Diameter: (both types) ..... 4.15 in; 105.50 mm
Weight (approximate):
  (3CX3000A7) ..... 6.2 lb; 2.8 kg
  (3CX3000F7/8162) ..... 7.5 lb; 3.4 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	5000	2.5	4800	1.5	435	5500†
AB_2	Cathode Driven RF Linear Amplifier	5000	2.5	4800	2.0	410	7260
AB_2	Grid Driven RF Linear Amplifier AM Service	5000	2.5	4000	0.74	11.5	1130
AB_2	Grid Driven AF Amplifier or Modulator	5000	2.5	4000	3.6*	115	10,500*
D	Switching Modulator	15,000	2.5	13,700	0.53	—	—

*Two tubes
†Useful Power Output

3CX4500A3, 3CX4500H3

The EIMAC 3CX4500A3 and 3CX4500H3 are medium-mu, forced-air cooled, external anode power triodes with a maximum plate dissipation rating of 4500 watts. High power output as an amplifier, oscillator, or modulator may be obtained at moderate voltages.

Plentiful reserve emission is available from the 525-watt filament, and the grid structure is rated 225 watts, making these tubes excellent choices for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 4500 watts
Grid Dissipation (Max.) ..... 225 watts
Frequency for Max. Ratings (CW)
(3CX4500A3) ..... 110 MHz
(3CX4500H3) ..... 75 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
Voltage ..... 7.0 volts
Current ..... 78 amperes
Capacitances (Gnd. Cath. Connection)
Input ..... 3.5 pF
Output ..... 0.9 pF
Feed-through ..... 20 pF
Amplification Factor 22
Base (3CX4500A3) ..... Special, coaxial
(3CX4500H3) ..... Flexible filament leads
Maximum Seal & Anode Core Temperature (Max.) .... 250°C
Maximum Length: (3CX4500A3) ..... 9 in; 22.76 cm
(3CX4500H3) ..... 18.437 in; 46.83 cm
Maximum Diameter: (both types) ..... 6.125 in; 55.56 mm
Weight (approximate) (3CX4500A3) ..... 9.1 lb; 4.1 kg
(3CX4500H3) ..... 9.5 lb; 4.3 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier or Oscillator	6000	3.0	6000	3.0	380	13,300
C	RF Amplifier Plate Modulated	5000	3.0	5000	1.72	175	7,120
AB	Grid Driven Amplifier or Modulator	6000	3.0	5000	2.0*	147	16,425*

*Two tubes.

3CX5000A3

The 3CX5000A3 is a medium-mu power triode designed primarily for use as a power oscillator in industrial heating applications. It is also recommended for use as a grounded-grid FM amplifier, as a conventional plate-modulated amplifier, or as a linear amplifier.

Plentiful reserve emission is available from the 560-watt filament. The grid structure is rated at 100 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 5000 watts
Grid Dissipation (Max.) ..... 100 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
Voltage ..... 7.5 volts
Current ..... 75.0 amperes
Capacitances (Gnd. Cath. Connection)
Input ..... 51.0 pF
Output ..... 1.5 pF
Feed-through ..... 25.0 pF
Amplification Factor 18
Base ..... Special, coaxial
Recommended Air System Socket SK-1300
Recommended Air Chimney Y-463
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.20 mm
Maximum Diameter: ..... 6.40 in; 162.70 mm
Weight (approximate) ..... 9.5 lb; 4.3 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7500	3.0	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	5000	2.5	—	—	—	—
C	RF Industrial Oscillator	10,000	3.0	9000	2.5	208	18,600
AB	Grid Driven Amplifier or Modulator	7500	4.0	—	—	—	—

3CX5000H3

The 3CX5000H3 is a medium-mu power triode intended for use in industrial radio-frequency heating services, or for conventional RF or audio amplifier or modulator applications.

Full input may be run up to 90 MHz. The 100-watt grid structure makes this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	100 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	74.5 amperes
Capacitances (Gnd. Cath. Connection)	
Input	51.0 pF
Output	1.5 pF
Feed-through	25.0 pF
Amplification Factor	18
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	17.50 in; 444.50 mm
Maximum Diameter:	6.45 in; 163.80 mm
Weight (approximate)	10.0 lb; 4.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7500	3.0	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	5000	2.5	—	—	—	—
C	RF Industrial Oscillator	10,000	3.0	9000	2.5	208	18,600
AB	Grid Driven AF Amplifier or Modulator	7500	4.0	—	—	—	—

3CX10,000A1/8158

The 3CX10,000A1/8158 is a low-mu power triode is primarily intended for use as an audio amplifier or modulator, or for voltage regulator applications where high current capability and low tube voltage drop are important.

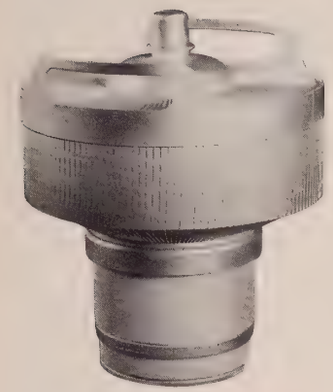
CHARACTERISTICS

Plate Dissipation (Max.)	12,000 watts
Grid Dissipation (Max.)	100 watts
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	51.0 pF
Output	4.1 pF
Feed-through	28.5 pF
Amplification Factor	6.0
Transconductance	20,000 μmhos
Base	Coaxial
Recommended Air System Socket	SK-1300
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	8.75 in; 222.20 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	7.0*	0	29,100*
A	Grid Driven AF Amplifier or Modulator	7000	5.0	2500	4.0	0	1800
A	Voltage Regulator	10,000	5.0	–	–	–	–

*Two tubes

3CX10,000A3/8159



The 3CX10,000A3/8159 is a medium-mu, power triode intended for use as a power oscillator in industrial heating applications or as an RF power amplifier in Class C or Class AB_2 linear service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 250 watts
Frequency for Max. Ratings (CW) ..... 160 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 53.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Coaxial
Recommended Air System Socket SK-1300
Recommended Air Chimney SK-1306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.20 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	7000	4.0	7000	4.0	4100	24,500
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	515	12,400
C	RF Industrial Oscillator or Amplifier	7000	4.0	7000	4.0	600	22,400
AB_2	Cathode Driven RF Linear Amplifier	7000	5.0	7000	4.0	2050	20,000

3CX10,000A7/8160

The 3CX10,000A7/8160 is a high-mu power triode is intended for use as a zero-bias Class B amplifier in audio or RF applications, or as a Class C amplifier, CW or modulated.

Operation in Class B with zero grid bias offers circuit simplicity by eliminating the bias supply, and in addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained with the tube.

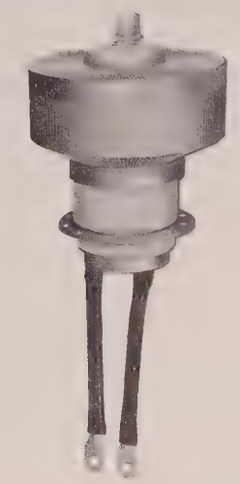
CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 160 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 59.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 59.0 pF
  Output ..... 36.0 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... Coaxial
Recommended Air System Socket ..... SK-1300 or SK-1320
Recommended Air Chimney SK-1306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.20 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	8000	4.0	7600	3.7	1510	22,500
C	Grid Driven RF Amplifier Plate Modulated	6500	3.0	5000	3.0	380	11,900
AB_2	Cathode Driven RF Linear Amplifier	8000	5.0	7000	5.0	1540	24,200
AB_2	Cathode Driven RF Linear Amplifier AM Service	8000	5.0	7000	2.4	330	5600
AB_2	Grid Driven AF Amplifier or Modulator	8000	5.0	7000	10.0*	560	47,700*

*Two tubes

3CX10,000H3



The 3CX10,000H3 is a medium-mu power triode designed primarily for use in industrial RF heating service. Input of 40 kW is permissible up to 90 MHz.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 250 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 53.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 17.75 in; 450.80 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 13.0 lb; 5.9 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	10,000	4.0	9000	4.0	570	29,000

3CX10,000U7

The 3CX10,000U7 high-mu triode is designed for use as a cathode-driven RF amplifier in the VHF spectrum. It is a very linear device making it ideally suited for TV service in addition to CW and pulsed RF amplifier service.

The 3CX10,000U7 makes use of a beam-forming cathode and control grid geometry to produce high gain, low grid interception, and zero-bias operation capability.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 50 watts
Frequency for Max. Ratings (CW) ..... 250 MHz
  Pulsed ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 15.0 volts
  Current ..... 13.0 amps
Capacitances (Cathode Driven)
  Input ..... 90.0 pF
  Output ..... 28.8 pF
  Feed-through ..... 0.25 pF
Amplification Factor 200
Base ..... Special Coaxial
Socket ..... Collets available
  Heater 720638
  Heater/Cathode 720637
  Grid 720636
  Anode Collet Assembly 720635
Maximum Seal & Temperature ..... 250°C
Maximum Length: ..... 6.7 in; 170 mm
Maximum Diameter: ..... 7.05 in; 179 mm
Weight ..... 20 lb; 9.1 kg
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven Low Band TV Linear RF Amplifier*	6500	4	5000	3.72	400	10,000
AB	Cathode Driven High Band TV Linear RF Amplifier*	6500	4	5500	3.6	410	10,000
C	Cathode Driven Pulse RF Amplifier	13,000	100†	—	—	—	—

*Peak of synch conditions
†Peak value

3CX15,000A3

The 3CX15,000A3 is a medium-mu power triode designed for use as a power oscillator in industrial radio frequency heating applications. It is also recommended for use as a conventional plate-modulated amplifier, or as a linear amplifier. The one kilowatt filament and rugged 500 watt grid structure make this tube especially suitable for heavy duty service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 15,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 55.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Coaxial
Recommended Air System Socket SK-1300
Recommended Air Chimney SK-1306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.30 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	8000	6.0	8000	5.9	740	34,000
C	Grid Driven RF Amplifier Plate Modulated	6500	5.0	5000	3.9	490	18,000
AB	Grid Driven RF Linear Amplifier	8000	6.0	7000	4.8	215	23,000

3CX15,000A7

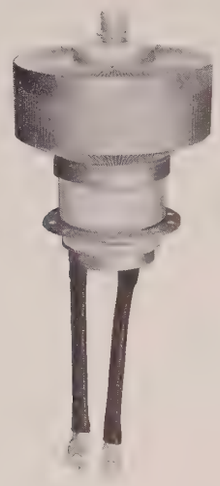
The 3CX15,000A7 is a high-mu power triode intended for use as a zero-bias Class B RF amplifier or Class C power amplifier or oscillator. It is also recommended for use as a grounded grid FM amplifier. Class B operation with zero bias offers circuit simplicity. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 15,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 61.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 61.0 pf
  Output ..... 36.0 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... Coaxial
Recommended Air System Socket ..... SK-1300 or SK-1320
Recommended Air Chimney SK-1306
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.30 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	8000	5.0	7000	4.0	430	21,300
AB	Cathode Driven RF Linear Amplifier	8000	6.0	7000	5.9	1750	29,600

3CX15,000H3



The 3CX15,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 15,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 55.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Recommended Air Chimney SK-1306
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 17.75 in; 450.80 mm
Maximum Diameter: ..... 7.05 in; 179.10 mm
Weight (approximate) ..... 13.0 lb; 5.9 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	12,000	6.0	10,000	5.0	650	41,200

3CX20,000A3

The 3CX20,000A3 is a medium-mu power triode for industrial oscillator or general communications service. It is recommended for Class C amplifier service, or Class B radio frequency and audio frequency amplifier use.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 750 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 70.0 pF
  Output ..... 2.3 pF
  Feed-through ..... 43.0 pF
Base ..... Coaxial
Recommended Air System Socket SK-1300
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 10.00 in; 254.0 mm
Maximum Diameter: ..... 8.00 in; 203.0 mm
Weight (approximate) ..... 19.5 lb; 8.8 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	12,000	8.0	10,000	7.9	960	64,000
C	Grid Driven RF Amplifier Plate Modulated	6500	5.5	6500	5.0	1500	27,500
AB	Grid Driven RF Linear Amplifier	8000	8.0	7500	7.4	400	40,000
AB	Grid Driven AF Amplifier or Modulator	8000	8.0	7500	14.8*	800	80,000*

*Two tubes

3CX20,000A7

The 3CX20,000A7 is a high-mu power triode intended for use as a zero-bias Class B RF amplifier or Class C power amplifier or oscillator. Class B operation with zero grid bias offers circuit simplicity. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 61.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 61.0 pF
  Output ..... 36.0 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... Coaxial
Recommended Air System Socket ..... SK-1300 or SK-1320
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 8.75 in; 222.20 mm
Maximum Diameter: ..... 8.31 in; 211.10 mm
Weight (approximate) ..... 13.5 lb; 6.15 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier at 110 MHz	8000	5.0	7000	4.0	430	21,300
C	Cathode Driven RF Amplifier at 110 MHz	8000	5.0	7800	4.2	2300	27,500
B	Cathode Driven RF Amplifier TV Service at 216 MHz†	8000	6.0	7200	5.8	1700	27,500
AB	Cathode Driven RF Linear Amplifier at 110 MHz	8000	6.0	7000	5.0	1540	24,200

†Peak Sync. Level

3CX20,000H3

The 3CX20,000H3 is a medium-mu power triode designed for use as an industrial oscillator in the LF to lower VHF range (30 kHz to 90 MHz). This triode is also recommended for AM broadcast service as a modulator, modulated RF stage, or as a linear amplifier.

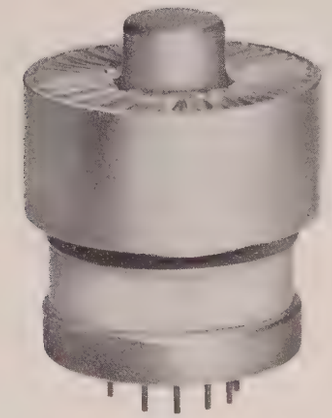
CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 750 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 70.0 pF
  Output ..... 2.3 pF
  Feed-through ..... 43.0 pF
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 19.00 in; 482.60 mm
Maximum Diameter: ..... 8.00 in; 203.20 mm
Weight (approximate) ..... 20.0 lb; 9.1 kg
Operating Position ..... Vertical, base up or down

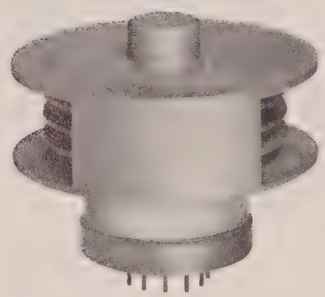
Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	12,000	8.0	10,000	7.9	960	64,000
C	Grid Driven RF Amplifier Plate Modulated	6500	5.5	6500	5.0	1500	27,500
AB	Grid Driven AF Amplifier or Modulator	8000	8.0	7500	14.8*	800	80,000*

*Two tubes

8874, 8875



8874



8875

The 8874 and 8875 are compact high-mu power triodes intended for use in zero-bias Class B amplifiers in audio or RF applications. The two types differ only in method of cooling and anode dissipation; the 8874 requires axial-flow forced-air cooling and is rated for 400 watts; and the 8875 has a transverse cooler for forced-air cooling and is rated for 300 watts.

Operation with zero grid bias simplifies circuitry by eliminating the normal bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

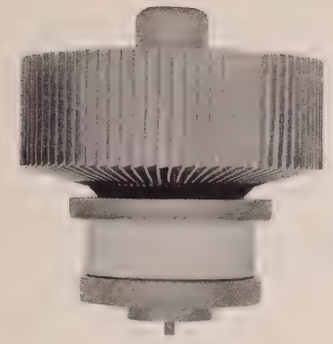
CHARACTERISTICS

Plate Dissipation (Max.) 8874	400 watts
8875	300 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.3 volts
Current	3.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	20.5 pF
Output	0.03 pF
Feed-through	6.0 pF
Capacitances (Gnd. Grid Connection):	
Input	20.5 pF
Output	6.0 pF
Feed-through	0.03 pF
Cathode-Heater	6.0 pF
Amplification Factor	240
Transconductance††	29,000 μmhos
Base	Large Wafer Elevenar 11-pin with Ring (JEDEC No. E11-81)
Recommended Socket	Eimac P/N 154353
Recommended Chimney for 8874	Eimac SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length: (8874)	2.14 in; 54.40 mm
(8875)	2.18 in; 55.50 mm
Maximum Diameter: (8874)	1.64 in; 41.70 mm
(8875)	2.52 in; 64.00 mm
Weight (approximate): (8874)	4.3 oz; 122 gm.
(8875)	8.6 oz; 244 gm.
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_2	Cathode Driven RF Linear Amplifier at 30 MHz	2200	0.35	2000	0.50* 0.31**	26	587†
AB_2	Cathode Driven RF Linear Amplifier at 150 MHz	2200	0.35	2000	0.40* 0.245**	17.5	526†
AB_2	Cathode Driven RF Linear Amplifier at 432 MHz	2200	0.35	2000	0.50* 0.30**	27	505†
C	Grid Driven RF Power Amplifier at 110 MHz	2200	0.35	2000	0.25	9.0	305†
—	Pulse Modulator or Regulator	4500	6.0 (Short Pulse)	—	—	—	—

*Single-tone Intermittent Voice Service value
**Two-tone plate current
†Useful power output
††At I_b = 250 mA

8938



The 8938 is a rugged coaxial-base power triode designed for use as a cathode driven Class AB_2 or Class C amplifier.

It is recommended for VHF or UHF service as a linear amplifier, power amplifier, or pulse amplifier. Linearity and power gain are both excellent due to the low ratio of grid to plate current, and the relatively high amplification factor. Low grid interception of available emission current is due to the beam forming geometry of the special grid and cathode design.

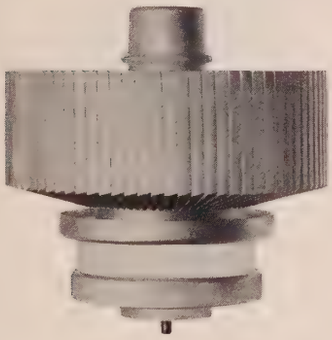
CHARACTERISTICS

Plate Dissipation (Max.) ..... 1500 watts
Grid Dissipation (Max.) ..... 20 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 5.0 volts
  Current ..... 10.5 amperes
Capacitances (Gnd. Grid Connection):
  Input ..... 35.5 pF
  Output ..... 12.4 pF
  Feed-through ..... 0.14 pF
Amplification Factor 125
Transconductance ..... 55,000 μmhos
Base ..... Coaxial
Recommended Air-System Socket‡ SK-2220
Recommended Air Chimney SK-2216
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 3.68 in; 93.40 mm
Maximum Diameter: ..... 3.38 in; 85.80 mm
Weight (approximate) ..... 25 oz; 709 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier at 400 MHz	4000	1.0	3000	1.0	83	1570†
AB_2	Cathode Driven RF Linear Amplifier up to 30 MHz	4000	1.0	3500	0.97	50	2030†

†Useful Power Output
‡Individual Collets available

8962



The 8962 is a high-mu triode designed with beam-forming cathode and control grid geometry, and coaxial base terminals. This focused-triode design makes possible the simplicity and circuit advantages of a triode combined with the gain of a tetrode.

The tube is intended for use above 200 MHz, with good gain in cathode driven (grounded grid) circuitry, and is especially useful in the 806 to 950 MHz band allocated to land mobile services, where typical gain of 10 dB may be obtained in a suitable amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1500 watts
Grid Dissipation (Max.) ..... 30 watts
Frequency for Max. Ratings (CW) ..... 1000 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 4.5 volts
  Current ..... 11 amperes
Capacitances (Gnd. Grid Connection):
  Input ..... 28.0 pF
  Output ..... 13.0 pF
  Feed-through ..... 0.04 pF
Amplification Factor 300
Transconductance ..... 50,000 μmhos
Base ..... Coaxial
Available Contact Collets:
  Anode ..... Part No. 135304
  Grid 135305
  Cathode 135306
  Heater 135307
  Heater (center pin) 135310
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length ..... 3.50 in; 89.00 mm
Maximum Diameter ..... 3.40 in; 86.00 mm
Weight (approximate) ..... 25 oz; 709 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION					
		Plate Voltage (volts)	Plate Current (amps)	Freq. (MHz)	Driven Element	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	RF Linear Amplifier	2000	1.0	850	Cath.	2000	1.0	68	680†

† Useful, measured at the load.

TENTATIVE

8873

The 8873 is a compact high-mu power triode intended for use in zero-bias Class-B or AB amplifiers in audio or radio-frequency applications, but may also be used in Class-C service or as a pulse modulator or regulator.

The 8873 is designed for conduction cooling and is nominally rated for 200 watts of anode dissipation. A beryllium-oxide thermal link is available to insulate the anode from the heat sink while allowing for heat conduction from the anode to the sink.

Operation with zero bias simplifies associated circuitry by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

CHARACTERISTICS

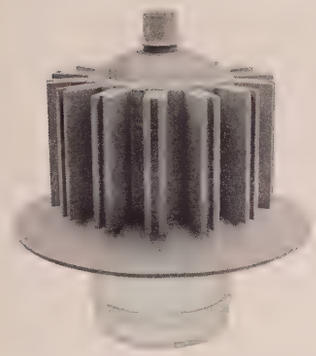
Plate Dissipation [1] (Max.)	200 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW))	500 MHz
Cooling	Conduction
Cathode	Oxide-coated Unipotential
Voltage	6.3 volts
Current	3.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	20.5 pF
Output	0.03 pF
Feed-through	6.0 pF
Capacitances (Gnd. Grid Connection):	
Input	20.5 pF
Output	6.0 pF
Feed-through	0.03 pF
Cathode to heater	6.0 pF
Transconductance ††	29,000 μmhos
Base	Large Wafer Elevenar 11-Pin with ring (JEDEC No. E11-81)
Recommended Socket	Eimac P/N 154353
Recommended BeO Thermal Link	Eimac SK-1920
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.14 in; 54.41 mm
Maximum Diameter:	1.64 in; 41.66 mm
Weight (approximate)	8.5 oz; 241 gm
Operating Position	Any

[1]Dissipation capability is dependent on cooling technique.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_2	Cathode Driven RF Linear Amplifier at 30 MHz	2200	0.35	2000	0.50* 0.31**	26	587†
AB_2	Cathode Driven RF Linear Amplifier at 150 MHz	2200	0.35	2000	0.40* 0.245**	17.5	526†
AB_2	Cathode Driven RF Linear Amplifier at 432 MHz	2200	0.35	2000	0.50* 0.30**	27	505†
C	Grid Driven RF Amplifier at 110 MHz	2200	0.35	2000	0.25	9.0	305†
—	Pulse Modulator or Regulator	4500	6.0 (Short pulse)	—	—	—	—

*Single-tone Intermittent Voice Service value
**Two-tone plate current
† Useful power output
††At I_b = 250 mA

3CV30,000A3



The 3CV30,000A3 is a medium-mu power triode recommended as a conventional plate-modulated amplifier or as a linear amplifier in new equipment designs. Its vapor-cooled anode is conservatively rated at 30 kW of plate dissipation when mounted in a BR-200 boiler. Full input of 60 kW is permissible up to 100 MHz.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 30,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 55.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Coaxial
Recommended Air System Socket SK-1310
Recommended Air Boiler BR-200
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 8.62 in; 218.90 mm
Maximum Diameter: ..... 7.75 in; 196.80 mm
Weight (approximate) ..... 18.0 lb; 8.2 kg
Operating Position ..... Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Power Amplifier Plate Modulated	7000	5.0	7000	5.0	750	27,500
C	RF Industrial Oscillator	10,000	6.0	10,000	6.0	365	42,000
AB_2	Grid Driven RF Linear Amplifier	10,000	6.0	10,000	6.0	240	41,000

3CV30,000H3

The 3CV30,000H3 is a medium-mu power triode recommended as an audio amplifier, a conventional plate-modulated amplifier or as a linear amplifier in new equipment designs.

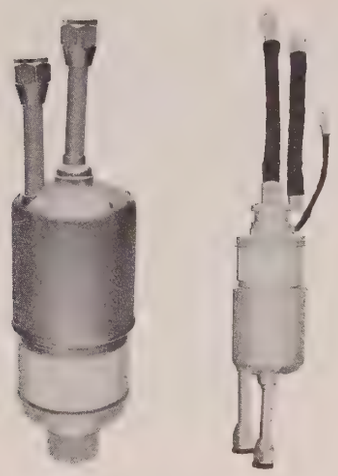
CHARACTERISTICS

Plate Dissipation (Max.) ..... 30,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 55.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Recommended Boiler BR-200
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 17.63 in; 447.80 mm
Maximum Diameter: ..... 7.75 in; 196.80 mm
Weight (approximate) ..... 18.0 lb; 8.2 kg
Operating Position ..... Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier Plate Modulated	7000	5.0	7000	5.0	750	27,500
C	RF Industrial Oscillator	10,000	6.0	10,000	6.0	365	42,000
AB_2	Grid Driven AF Amplifier or Modulator	10,000	6.0	9600	6.2*	50	36,000*

*Two tubes.

3CW5000A3/8242, 3CW5000F3/8243



3CW5000A3/8242, 3CW5000F3/8243

The 3CW5000A3/8242 and 3CW5000F3/8243 are medium-mu power triodes intended for use in amplifier, oscillator, or modulator service. Their maximum rated anode dissipation is 5000 watts.

These tubes are water-cooled versions of the air-cooled 3CX2500A3/8161 and 3CX2500F3/8251.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 5000 watts
Grid Dissipation (Max.) ..... 150 watts
Frequency for Max. Ratings (CW) ..... 75 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 51.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 35.0 pF
  Output ..... 0.9 pF
  Feed-through ..... 20.0 pF
Amplification Factor 22
Transconductance † ..... 20,000 μmhos
Base (3CW5000A3/8242) ..... Coaxial
  (3CW5000F3/8243) ..... Flexible Filament Leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: (3CW5000A3/8242) .. 12.62 in; 320.50 mm
  (3CW5000F3/8243) .. 22.06 in; 560.30 mm
Maximum Diameter: (both types) ..... 3.63 in; 92.10 mm
Weight (approximate): (3CW5000A3/8242) ..... 4.8 lb; 2.2 kg
  (3CW5000F3/8243) ..... 6.0 lb; 2.7 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Drive Power (watts)	TYPICAL OPERATION: Output Power (watts)
C	Grid Driven RF Amplifier	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier Plate Modulated	5000	2.0	5000	1.5	76	5580
AB_2	Grid Driven AF Amplifier or Modulator	6000	2.5	6000	3.0*	113	13,000*
AB_2	Grid Driven AF Amplifier or Modulator	6000	2.5	5000	2.3*	59	8000*

*Two tubes
†At I_b = 0.83 A

3CW5000F1/8241

The 3CW5000F1/8241 is a low-mu power triode intended for use as audio amplifiers or modulators. The maximum rated plate dissipation is 5000 watts.

Two tubes in Class AB_1 audio service will deliver more than 10 kW maximum-signal plate output power at 6000 plate volts without drawing grid current.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 5000 watts
Grid Dissipation (Max.) ..... 50 watts
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 50.5 amperes
Amplification Factor 4.9
Transconductance † ..... 11,000 μmhos
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 22.06 in; 560.30 mm
Maximum Diameter: ..... 3.63 in; 92.10 mm
Weight (approximate) ..... 6.0 lb; 2.7 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Drive Power (watts)	TYPICAL OPERATION: Output Power (watts)
AB_1	Grid driven AF Amplifier or Modulator	6000	2.5	6000	2.7*	0	10,000*

*Two tubes
†At I_b = 1.0 A

3CW5000H3

The 3CW5000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 12.5 kW is permissible up to 75 MHz. The grid structure is rated at 150 watts making this tube an excellent choice for severe applications.

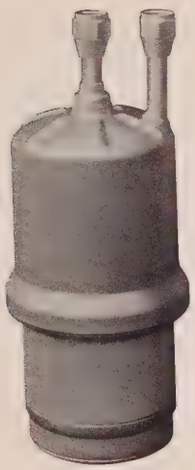
CHARACTERISTICS

Plate Dissipation (Max.) ..... 5000 watts
Grid Dissipation (Max.) ..... 150 watts
Frequency for Max. Ratings (CW) ..... 75 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 51.5 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 35.0 pF
  Output ..... 0.9 pF
  Feed-through ..... 20.0 pF
Amplification Factor 20
Transconductance † ..... 20,000 μmhos
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 18.56 in; 471.40 mm
Maximum Diameter: ..... 5.42 in; 137.70 mm
Weight (approximate) ..... 7.5 lb; 3.4 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	6000	2.5	6000	2.1	136	10,000

†At I_b = 0.83 A.

3CW10,000A3



The 3CW10,000A3 is a medium-mu power triode designed for applications where air cooling is not practical. Typical applications include industrial oscillators, RF power amplifier, modulator and a series pass tube in regulated power supplies.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 100 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 75 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 51.0 pF
  Output ..... 1.5 pF
  Feed-through ..... 25.0 pF
Amplification Factor 20
Base ..... Special Coaxial
Recommended Air System Socket SK-1310
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 18.75 in; 476 mm
Maximum Diameter: ..... 6.8 in; 173 mm
Weight (approximate) ..... 10 lb; 4.5 kg
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	7500	3.0	—	—	—	—
C	RF Industrial Oscillator	10,000	3.0	9000	2.5	208	18,600
AB or B	AF Amplifier or Modulator	7500	4.0	—	—	—	—

3CW10,000H3

The 3CW10,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 30 kW is permissible up to 90 MHz. The grid structure is rated at 150 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Grid Dissipation (Max.) ..... 100 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 75.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 51.0 pF
  Output ..... 1.5 pF
  Feed-through ..... 25.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 18.75 in; 476.20 mm
Maximum Diameter: ..... 6.80 in; 172.70 mm
Weight (approximate) ..... 10 lb; 4.54 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	10,000	3.0	9000	2.9	—	20,600

3CW20,000A1

The 3CW20,000A1 is a low-mu power triode intended primarily for use as an audio amplifier or modulator. This tube is also recommended for voltage-regulator applications where high current capability and low tube drop are important. Except for plate dissipation, the tube is electrically identical to the 3CX10,000A1/8158.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 100 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 51.0 pF
  Output ..... 4.0 pF
  Feed-through ..... 29.0 pF
Amplification Factor 6.0
Transconductance † ..... 20, 000 μmhos
Base ..... Coaxial
Recommended Air System Socket SK-1300
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 11.22 in; 284.90 mm
Maximum Diameter: ..... 4.65 in; 118.10 mm
Weight (approximate) ..... 11.5 lb; 5.2 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	5000	4.0	5000	2.8	385	11,000
AB_1	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	7.0*	0	29,100*
A	Grid Driven AF Amplifier or Modulator	7000	5.0	2500	4.0	0	1800
A	Voltage Regulator	10,000	5.0	5000	2.0	—	—

*Two tubes.
†At I_b = 2.0A.

3CW20,000A3

The 3CW20,000A3 is a medium-mu power triode intended primarily for use as a power oscillator in industrial heating applications. It is also recommended for use as a conventional plate-modulated amplifier, or as a linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 250 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 53.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Coaxial
Recommended Air System Socket SK-1300
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 11.22 in; 285.00 mm
Maximum Diameter: ..... 4.65 in; 118.10 mm
Weight (approximate) ..... 11.5 lb; 5.2 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	7000	4.0	7000	4.0	4100	24,500
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	515	12,400
C	RF Industrial Oscillator	7000	4.0	7000	4.0	—	22,400
AB_2	Cathode Driven RF Linear Amplifier	7000	5.0	7000	4.0	2050	20,000

3CW20,000A7

The 3CW20,000A7 is a high-mu power triode intended to be used as a zero-bias Class-B amplifier in audio or radio-frequency applications. Operation with zero grid bias offers circuit simplicity by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

The 3CW20,000A7 is electrically identical to the air-cooled 3CX10,000A7 except for its 20kW plate dissipation rating.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 59.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Capacitances (Gnd. Grid Connection)
  Input ..... 59.0 pF
  Output ..... 36.0 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... Coaxial
Recommended Air System Socket SK-1300
Maximum Seal Temperature ..... 250°C
Maximum Length: ..... 11.22 in; 285.00 mm
Maximum Diameter: ..... 4.65 in; 118.10 mm
Weight (approximate) ..... 11.5 lb; 5.2 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7000	4.0	7000	4.0	530	21,300
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	380	11,900
B	Cathode Driven RF Linear Amplifier	7000	5.0	7000	5.0	1540	24,200
B	Cathode Driven RF Linear Amplifier (AM Service)	7000	5.0	7000	2.4	330	5650†
B	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	10.0*	560	47,700*

*Two tubes.
†Carrier Power.

3CW20,000H3

The 3CW20,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 40 kilowatts is permissible up to 90 MHz. The grid structure is rated at 250 watts, making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 250 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 53.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 18.25 in; 463.50 mm
Maximum Diameter: ..... 6.75 in; 171.40 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	4.0	10,000	4.0	340	28,000

3CW20,000H7

The 3CW20,000H7 is a high-mu power triode intended for use as a dc voltage or current regulator, or in high-voltage switch tube or pulsed regulator service.

In addition, since the tube is identical to the 3CW20,000A7 except for the anode and grid flanges and the addition of the filament flying leads, it is useful as a zero-bias Class B amplifier in audio or RF applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 99.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 59.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Amplification Factor 200
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 20.70 in; 525.80 mm
Maximum Diameter: ..... 6.75 in; 171.40 mm
Weight (approximate) ..... 12 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier	7000	5.0	7000	5.0	1540	24,200
AB	Cathode Driven RF Linear Amplifier (AM Service)	7000	5.0	7000	2.4	330	5650†
AB	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	10.0*	560	47,700*

*Two tubes.
†Carrier Power.

3CW30,000H3

The 3CW30,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 60 kW is permissible from its one kilowatt filament. The grid structure is rated at 500 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 30,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 53.0 pF
  Output ..... 1.4 pF
  Feed-through ..... 34.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 20.60 in; 523.24 mm
Maximum Diameter: ..... 6.75 in; 171.40 mm
Weight (approximate) ..... 12 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	6.0	10,000	6.0	365	42,000

3CW30,000H7

The 3CW30,000H7 is a high-mu power triode designed for use as a zero-bias Class B RF amplifier, Class C power amplifier or oscillator, or for voltage regulator service.

Input of 48 kW is permissible up to 110 MHz. Plentiful reserve emission is available from its one kilowatt filament.

Class B operation with zero grid bias offers circuit simplification by eliminating the bias supply.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 30,000 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 56.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 36.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 56.0 pF
  Output ..... 36.0 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 20.6 in; 524 mm
Maximum Diameter: ..... 6.75 in; 171.40 mm
Weight (approximate) ..... 12.0 lb; 5.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Power Amplifier	8000	5.0	7000	4.0	430	21,300
AB	Cathode Driven RF Linear Amplifier	8000	6.0	7000	5.0	1540	24,200
A	Voltage Regulator	28,000	6.0	—	—	—	—

3CW40,000H3

The 3CW40,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 100 kW is permissible up to 90 MHz. Plentiful reserve emission is available from its 1500-watt filament. The grid structure is rated at 750 watts, making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 40,000 watts
Grid Dissipation (Max.) ..... 750 watts
Frequency for Max. Ratings (CW) ..... 90 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 70.0 pF
  Output ..... 2.3 pF
  Feed-through ..... 43.0 pF
Amplification Factor 20
Base ..... Flexible filament leads
Maximum Seal Temperature ..... 250°C
Maximum Flexible Lead Temperature ..... 175°C
Maximum Length: ..... 21.23 in; 539.20 mm
Maximum Diameter: ..... 6.75 in; 171.40 mm
Weight (approximate) ..... 14 lb; 6.4 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	9.0	10,000	9.0	1040	70,000

8971/X-2177

The 8971/X-2177 medium-mu power triode is designed for very high power industrial heating service in the half-megawatt power range.

The 8971/X-2177 has a thoriated-tungsten cathode mounted on water-cooled supports. The maximum anode dissipation of the tube is 650,000 watts steady-state.

Provision is made for large-diameter coaxial terminals to the grid and the RF cathode terminals. Filament power and filament support cooling-water connections are made through two special couplings.

CHARACTERISTICS

Plate Dissipation ..... 650,000 watts
Grid Dissipation ..... 6,000 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 18.5 volts
  Current ..... 650 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 320 pF
  Output ..... 9.5 pF
  Feed-through ..... 210 pF
Amplification Factor 18
Base ..... Special
Recommended Cooling Water/Filament
  Power Connector (2 required) SK-2310
Recommended RF Return Connector SK-2315
Recommended Anode Water Connectors SK-2322
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 16.5 in; 419.1 mm
Maximum Diameter: ..... 17.03 in; 432.60 mm
Weight (approximate) ..... 153 lb; 69.5 kg
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (kW)	Output Power (kW)
C	RF Power Amplifier or Oscillator	20,000	65	18,000 15,500	56 56	12.0 14.0	750 650

8972/X-2176

The 8972/X-2176 is a medium-mu triode designed for very-high-power medium-frequency or high-frequency broadcast service and very-low-frequency communication in the megawatt power range.

The 8972-X-2176 has a two-section thoriated-tungsten filament mounted on water-cooled supports. The two sections may be fed in quadrature to reduce hum contributed by an ac power source. The maximum anode dissipation rating is 1250 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through three special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1,250,000 watts
Grid Dissipation (Max.) ..... 12,000 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Water and Forced Air
Filament ..... Two section, Thoriated Tungsten
  Voltage/section ..... 18.5 volts
  Current/section ..... 650 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 900 pF
  Output ..... 25.0 pF
  Feed-through ..... 350 pF
Amplification Factor 23
Base ..... Special
Recommended Cooling Water/Filament
  Power Connector (3 required) SK-2310
Recommended RF Return Connector SK-2315
Recommended Anode Water Connectors SK-2322
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 25.31 in; 642.90 mm
Maximum Diameter: ..... 17.03 in; 432.60 mm
Weight (approximate) ..... 190 lb; 87 kg
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (kW)	Output Power (kW)
C	RF Power Amplifier or Oscillator	20,000	125	18,000 15,500	110 110	30.0 32.0	1500 1300

3-400Z/8163

The 3-400Z/8163 is intended for use as a zero-bias Class B amplifier, in audio or radio-frequency applications, or in Class C service.

Operation with zero grid bias simplifies associated circuitry by eliminating the bias supply, and grounded grid operation is attractive since a power gain as high as twenty times can be obtained with this tube in a cathode-driven circuit.

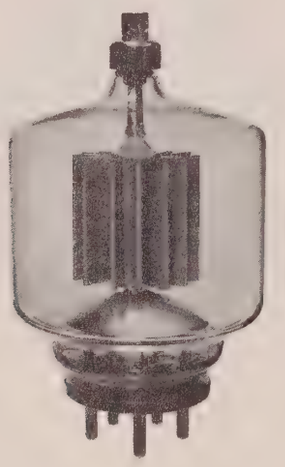
CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Grid Dissipation (Max.)	20 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation and Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.1 amperes
Capacitances (Gnd. Cath. Connection)	
Input	7.1 pF
Output	4.1 pF
Feed-through	0.10 pF
Amplification Factor	200
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-416
Maximum Plate Seal Temperature	225°C
Maximum Base Seal Temperature	200°C
Maximum Length:	5.5 in; 139.7 mm
Maximum Diameter:	3.56 in; 90.40 mm
Weight (approximate)	7.0 oz; 198.0 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	Grid driven RF Amplifier	4000	0.35	3000	0.33	25	730
C	Grid driven RF Amplifier Plate Modulated	3000	0.27	3000	0.24	18	550
B	Cathode driven RF Linear Amplifier	4000	0.40	2500	0.27	44	560
B	Grid driven AF Amplifier or Modulator	4000	0.40	3000	0.66*	26	1310*

*Two tubes.

3-500Z



The 3-500Z is intended for use as a zero-bias Class B amplifier in audio or radio frequency applications, or in Class C service.

Operation with zero grid bias simplifies associated circuitry by eliminating the bias supply, and grounded grid operation is attractive since a power gain as high as twenty times can be obtained with this tube in a cathode-driven circuit.

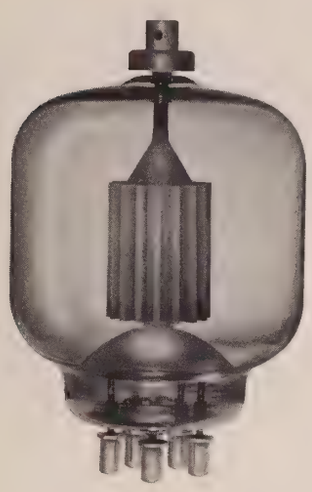
CHARACTERISTICS

Plate Dissipation (Max.)	500 watts
Grid Dissipation (Max.)	20 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation and Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.6 amperes
Capacitances (Gnd. Cath. Connection)	
Input	8.3 pF
Output	4.7 pF
Feed-through	0.1 pF
Amplification Factor	130
Base	5 Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-406
Recommended Heat Dissipating Connector	HR-6
Maximum Plate Seal Temperature	225°C
Maximum Base Seal Temperature	200°C
Maximum Length:	6.1 in; 154.94 mm
Maximum Diameter:	3.44 in; 87.40 mm
Weight (approximate)	7.0 oz; 198.0 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	Grid driven RF Amplifier	4000	0.35	3000	0.35	14	720†
C	Grid driven RF Amplifier Plate Modulated	3000	0.27	3000	0.27	25	640
C	Cathode driven RF Linear Amplifier	4000	0.40	3000	0.33	35	700†
AB_2	Cathode driven RF Linear Amplifier	4000	0.40	3000	0.40	46	740†
AB_2	Grid driven AF Amplifier or Modulator	4000	0.40	3000	0.77*	25	1420*

*Two tubes.
†Useful Power Output.

3-1000H



The 3-1000H is a medium-mu triode designed for use in industrial heating services.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Grid Dissipation ..... 50 watts
Cooling ..... Radiation and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 20.0 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 16 pF
  Output ..... 1 pF
  Feed-through ..... 7.5 pF
Amplification Factor 25
Base ..... 5-Pin Special
Recommended Air System Socket SK-510
Recommended Air Chimney SK-516
Recommended Heat Dissipating Connector HR-8
Maximum Plate Seal Temperature ..... 225°C
Maximum Base Seal Temperature ..... 200°C
Maximum Length: ..... 7.88 in; 200.2 mm
Maximum Diameter: ..... 5.25 in; 133.4 mm
Weight (approximate) ..... 1.2 lb.; 0.54 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Oscillator	6000	0.70	6000	0.70	—	3200

3-1000Z/8164

The 3-1000Z/8164 is intended for use as a Class B amplifier in either the grid or cathode-driven connection, for Class C amplifier service, or as Class B audio amplifiers or modulators. At a plate voltage of 3000 volts, 2 kW PEP input can be run with a single 3-1000Z, providing a power gain of over 20 in a cathode-driven circuit.

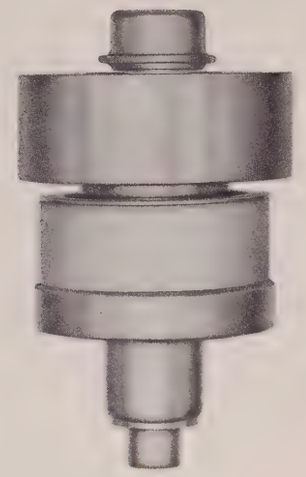
CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Grid Dissipation (Max.) ..... 50 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Radiation and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 20.0. amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 17.0 pF
  Output ..... 0.2 pF
  Feed-through ..... 7.5 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 17.0 pF
  Output ..... 7.5 pF
  Feed-through ..... 0.2 pF
Amplification Factor 200
Base ..... 5 Pin Special
Recommended Air-System Socket SK-510
Recommended Air Chimney SK-516
Recommended Heat Dissipating Connector HR-8
Maximum Plate Seal Temperature ..... 225°C
Maximum Base Seal Temperature ..... 200°C
Maximum Length: ..... 7.88 in; 200.20 mm
Maximum Diameter: ..... 5.25 in; 133.40 mm
Weight (approximate) ..... 1.2 lb.; 0.54 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid driven RF Amplifier	6000	0.70	6000	0.70	57	3200
C	Grid driven RF Amplifier Plate Modulated	4500	0.55	4500	0.50	35	1765
B	Cathode driven RF Linear Amplifier	6000	0.80	3000	0.67	47	1080
B	Grid driven AF Amplifier or Modulator	6000	0.80	5000	1.0*	28	3560*

*Two tubes.

4CPX250K/8590



The 4CPX250K/8590 is intended for wideband grid-pulsed radio frequency amplifier and pulse modulator service.

The 4CPX250K/8590 is capable of delivering pulse output power in excess of 10 kW with 10 dB gain when cathode driven at 450 MHz.

The tube is of coaxial construction and especially designed for cavity operation.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 2.7 amperes
Capacitances (Gnd. Grid Connection):
  Input ..... 14.0 pF
  Output ..... 4.1 pF
  Feed-through ..... 0.006 pF
Amplification Factor (g_1-g_2) 5
Base ..... Coaxial
Recommended Air System Socket . Special, collets available
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.81 in; 71.40 mm
Maximum Diameter: ..... 1.64 in; 41.60 mm
Weight (approximate) ..... 4 oz; 114 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2500	0.25	2500	250	0.25	2.8	500
C or B	RF Amplifier Grid and Screen Pulsed at 500 MHz	5500	6.0†	5500	1000†	—	1000†	10,000‡
—	Switch Tube or Pulse Modulator	7000	6.0†	6000	750	3.5†	—	17,500†

† Pulse value
‡ Useful Power Output

4CX250B/7203, 4CX250FG/8621

The 4CX250B/7203 and 4CX250FG/8621 have a maximum plate dissipation rating of 250 watts and a maximum input-power rating of 500 watts. The 4CX250B/7203 is designed to operate with a heater voltage of 6.0 volts, while the 4CX250FG/8621 is designed for operation at a heater voltage of 26.5 volts. Otherwise, the two tube types have identical characteristics.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage (4CX250B/7203) ..... 6.0 volts
  (4CX250FG/8621) ..... 26.5 volts
  Current (4CX250B/7203) ..... 2.6 amperes
  (4CX250FG/8621) ..... 0.54 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 15.7 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.04 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 13.0 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.01 pF
Amplification Factor (g_1-g_2) 5
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length ..... 2.46 in; 62.50 mm
Maximum Diameter ..... 1.64 in; 41.70 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 175 MHz	2000	0.25	2000	300	0.25	2.9	390
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	235
AB_1	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300
AB_1	RF Linear Amplifier (AM Service) up to 175 MHz	2000	0.25	2000	350	0.15	—	65†
AB_1	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	600*

*Two tubes
† Carrier Power

4CX250BC/8957

The 4CX250BC/8957 is especially recommended as a premium-quality replacement for the 4CX250B/7203, in applications where long life and consistent performance are of prime concern and the closer heater voltage tolerance and increased cathode warmup time are acceptable.

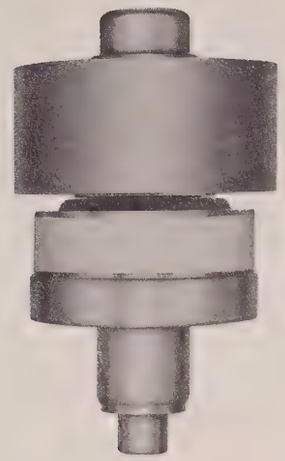
CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 2.4 amperes
Capacitances (Gnd. Grid Connection):
  Input ..... 15.7 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.04 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 13.0 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.01 pF
Amplification Factor (g_1-g_2) 5
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.46 in; 62.50 mm
Maximum Diameter: ..... 1.64 in; 41.70 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 175 MHz	2000	0.25	2000	300	0.25	2.9	390
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	235
AB_1	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300
AB_1	RF Linear Amplifier up to 175 MHz (AM Service)	2000	0.25	2000	350	0.15	—	65†
AB_1	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	600*

*Two tubes.
†Carrier Power

4CX250K/8245, 4CX250M/8246



The 4CX250K/8245 and 4CX250M/8246 have a maximum plate dissipation rating of 250 watts and a maximum input-power rating of 500 watts.

All element terminals are coaxial so the tube lends itself to cavity designs for VHF and UHF service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
(Pulsed) ..... 1500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
Voltage (4CX250K/8245) ..... 6.0 volts
(4CX250M/8246 ..... 26.5 volts
Current (4CX250K/8245) ..... 2.7 amperes
(4CX250M/8246) ..... 0.5 amperes
Capacitances (Gnd. Cath. Connection):
Input ..... 27.0 pF
Output ..... 4.7 pF
Feed-through ..... 0.04 pF
Capacitances (Gnd. Grid Connection):
Input ..... 17.0 pF
Output ..... 4.7 pF
Feed-through ..... 0.01 pF
Amplification Factor (g_1-g_2) 5
Base ..... Special, Coaxial
Socket ..... Collets available
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.81 in; 71.40 mm
Maximum Diameter: ..... 1.64 in; 41.70 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 500 MHz	2000	0.25	2000	300	0.25	—	225*
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	300
C	RF Amplifier Plate and Screen Pulsed at 1200 MHz	7000	7.0†	7000‡	1200‡	6.0	—	17,000§
B	RF Linear Amplifier TV Service up to 216 MHz	2000	0.25	2000	350	0.36	9	440•
AB_1	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300

* Useful Power Output
† Cathode Current, pulse
‡ Pulse Voltage Values
§ Pulse Power
• Peak of Sync. power

4CX250R/7580W

The 4CX250R/7580W is designed specifically for use in Class AB_1 linear amplifiers where shock and/or vibration preclude the use of nonruggedized tube types. The 4CX250R/7580W will replace the 4CX250B in equipments where the range of bias adjustment will tolerate this higher perveance tube and where tuning range can compensate for the small differences in input and output capacitances.

The 4CX250R/7580W will deliver more output power in most linear amplifiers which presently employ the 4CX250B and it will operate with maximum rated plate and screen voltage applied in equipments where shock and/or vibration is experienced.

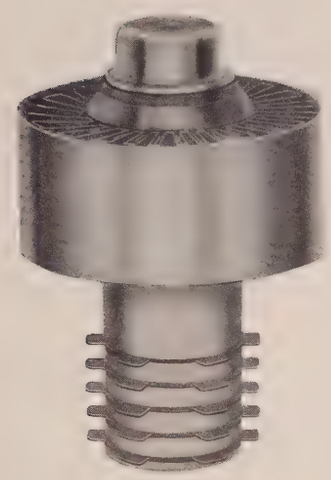
CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
Voltage ..... 6.0 volts
Current ..... 2.6 amperes
Capacitances (Gnd. Cath. Connection):
Input ..... 17.5 pF
Output ..... 4.8 pF
Feed-through ..... 0.04 pF
Amplification Factor (g_1-g_2) 5
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.46 in; 62.50 mm
Maximum Diameter: ..... 1.64 in; 41.70 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	2000	0.25	2000	400	0.25	—	300
AB_1	RF Linear Amplifier (AM Service)	2000	0.25	2000	400	0.17	—	100†
AB_1	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.
†Carrier Power

4CX300A/8167



The 4CX300A/8167 is a compact power tetrode having a maximum plate-dissipation rating of 300 watts.

The ceramic/metal construction and the internally unitized electrode structure combine to make the 4CX300A/8167 especially durable and free from mechanically induced noise under conditions of severe acceleration caused by shock or vibration.

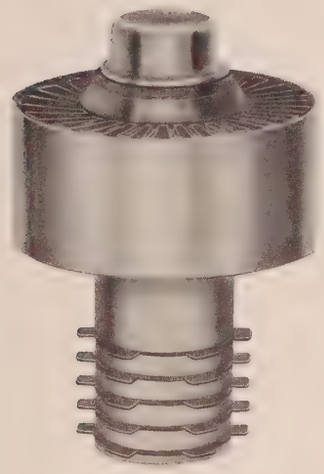
CHARACTERISTICS

Plate Dissipation (Max.) ..... 300 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 2.9 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 29.0 pF
  Output ..... 4.0 pF
  Feed-through ..... 0.04 pF
Amplification Factor (g_1 g_2) 4.8
Transconductance † ..... 12,000 μmhos
Base ..... Special, Breechblock
Recommended Air-System Socket SK-700
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.50 in; 63.50 mm
Maximum Diameter: ..... 1.64 in; 41.60 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2000	0.25	2000	250	0.25	2.9	390
C	RF Amplifier at 500 MHz	2000	0.25	2000	250	0.25	—	225‡
C	RF Amplifier Plate Modulated	1500	0.20	1500	250	0.20	1.7	235
AB_1	RF Linear Amplifier	2500	0.25	2500	350	0.25	—	400
AB_1	RF Linear Amplifier (AM Service)	2500	0.25	2500	350	0.15	—	85§
AB_1	AF Amplifier or Modulator	2500	0.25	2500	350	0.50*	—	800*

* Two tubes
† At I_b = 200 mA
‡ Useful Power Output
§ Carrier Power

4CX300Y/8561



The 4CX300Y/8561 is a compact power tetrode having a maximum plate dissipation rating of 400 watts. It may be operated at maximum ratings to 110 MHz.

The ceramic/metal construction and the internally-unitized electrode structure combine to make the 4CX300Y/8561 especially durable and free from mechanically-induced noise under conditions of severe acceleration caused by shock or vibration.

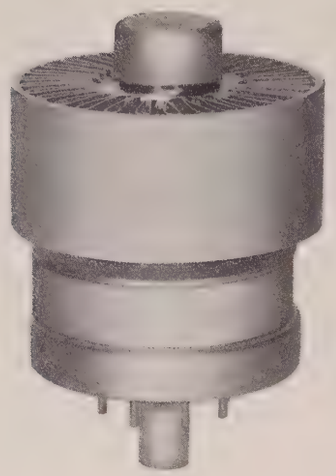
CHARACTERISTICS

Plate Dissipation (Max.) ..... 400 watts
Screen Dissipation (Max.) ..... 8 watts
Grid Dissipation (Max.) ..... 1 watt
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 3.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 34.0 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.04 pF
Amplification Factor (g_1-g_2) 5.6
Base ..... Special, Breeechblock
Recommended Air-System Socket SK-700
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.50 in; 63.50 mm
Maximum Diameter: ..... 1.64 in; 41.60 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2000	0.40	2000	250	0.40	3.8	600
C	RF Amplifier Plate Modulated	1500	0.30	1500	250	0.30	1.7	300
AB_1	RF Linear Amplifier	2000	0.40	2000	400	0.38	—	415
AB_1	RF Linear Amplifier (AM Service)	2000	0.40	2000	400	0.20	—	115†
AB_1	AF Amplifier or Modulator	2000	0.40	2000	400	0.75*	—	890*

*Two tubes
†Carrier power

4CX350A/8321, 4CX350F/8322



The 4CX350A/8321 and 4CX350F/8322 have a maximum plate dissipation of 350 watts and are intended for Class AB audio or RF amplifier service. The tube is externally identical to the 4CX250B but contains rugged internal construction features. Amplification factor and cathode area have been increased over the basic 4CX250B to give higher transconductance and figure of merit.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 350 watts
Screen Dissipation (Max.) ..... 8 watts
Grid Dissipation (Max.) ..... 0 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage (4CX350A/8321) ..... 6.0 volts
  (4CX350F/8322) ..... 26.5 volts
  Current (4CX350A/8321) ..... 2.9 amperes
  (4CX350F/8322) ..... 0.73 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 23.6 pF
  Output ..... 5.6 pF
  Feed-through ..... 0.03 pF
Amplification Factor (g_1–g_2) 13
Transconductance † ..... 22,000 μmhos
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.47 in; 62.60 mm
Maximum Diameter: ..... 1.64 in; 41.60 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	2500	0.30	2200	400	0.29	—	385
AB_1	AF Amplifier or Modulator	2500	0.30	2200	400	0.58*	—	770*

*Two tubes.
†At I_b = 150 mA.

4CX350FJ/8904

The 4CX350FJ/8904 is intended for Class AB linear RF amplifier service. The tube has rugged internal construction features.

The 4CX350FJ/8904 may be used as an exact replacement for the 4CX350F/8322 in most applications, requiring only minor circuit adjustment and retuning. The tube has improved intermodulation distortion characteristics. It contains a 26.5 volt heater, and is recommended for new equipment designs.

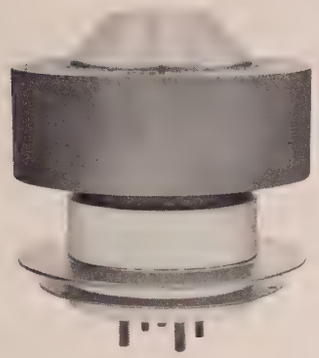
CHARACTERISTICS

Plate Dissipation (Max.) ..... 350 watts
Screen Dissipation (Max.) ..... 8.0 watts
Grid Dissipation (Max.) ..... 0 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 26.5 volts
  Current ..... 0.65 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 22.0 pF
  Output ..... 5.9 pF
  Feed-through ..... 0.033 pF
Amplification Factor (g_1–g_2) 17
Transconductance † ..... 22,000 μmhos
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-606
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.46 in; 62.60 mm
Maximum Diameter: ..... 1.64 in; 41.60 mm
Weight (approximate) ..... 4 oz; 113 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	2500	0.30	2200	400	0.23	—	250*

*Useful Power Output.
†At I_b = 150 mA.

4CX600B, 4CX600F



The 4CX600B and 4CX600F are designed for use in wideband amplifiers, particularly distributed amplifiers.

The mechanical and electrical features of these tubes are compatible with wideband amplifier circuit requirements; having low lead inductance, low input and output capacitances, small size and high transconductance.

Rugged construction consisting of a unitized electrode structure and direct mounting to the chassis combine to make the 4CX600B and 4CX600F suitable for environments of severe shock and vibration.

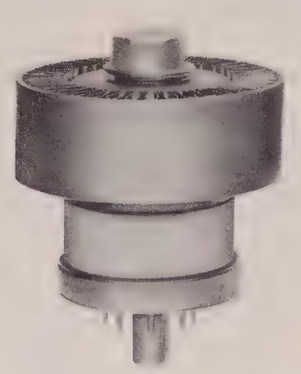
CHARACTERISTICS

Plate Dissipation (Max.) ..... 600 watts
Screen Dissipation (Max.) ..... 15 watts
Grid Dissipation (Max.) ..... 3 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage (4CX600B) ..... 6.0 volts
  (4CX600F) ..... 26.5 volts
  Current (4CX600B) ..... 4.3 amperes
  (4CX600F) ..... 1.05 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 45.0 pF
  Output ..... 5.8 pF
  Feed-through ..... 0.15 pF
Input Conductance
  (I_b = 0.6 Adc, f = 30 MHz) .....0.1×10^{-3}mhos
Transconductance
  (I_b = 0.6 Adc) ..... 41,000 μmhos
Base ..... Special
Recommended Screen Bypass Capacitor SK-680
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.45 in; 62.20 mm
Maximum Diameter: ..... 2.08 in; 52.80 mm
Weight (approximate) ..... 7 oz; 198 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	RF Amplifier TV Service at 865 MHz	2500	0.60	2000	300	0.60†	52†	585†
AB	RF Amplifier up to 432 MHz	2500	0.60	1800	300	0.60	25	700*
AB	RF Amplifier at 865 MHz	2500	0.60	2000	300	0.60	52	585*
AB	RF Linear Amplifier Broadband Service	3000	0.60	2500	275	0.59	—	1000

*Useful Power Output.
†Sync. level.

4CX600J/8809, 4CX600JA/8921



4CX600J/8809

4CX600JA/8921

The 4CX600J/8809 is a low-voltage, high current tetrode specifically designed for exceptionally low intermodulation distortion and low grid interception.

The 4CX600JA/8921 has a larger anode cooling for reduced cooling air pressure-drop. It is electrically identical to the 4CX600J.

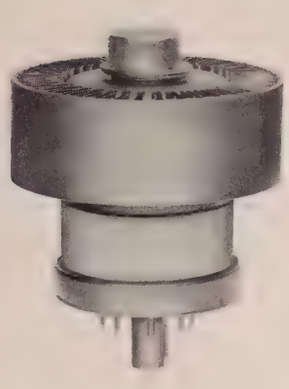
CHARACTERISTICS

Plate Dissipation (Max.) ..... 600 watts
Screen Dissipation (Max.) ..... 15 watts
Grid Dissipation (Max.) ..... 1 watt
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 5.4 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 50 pF
  Output ..... 6.3 pF
  Feed-through ..... 0.13 pF
Transconductance
  (I_b = 0.3 Adc, E_{c2} = 350 Vdc) ..... 27,000 μmhos
Base ..... 9-Pin Special
Recommended Air-System Socket SK-607
Recommended Air Chimney (4CX600J) SK-646
  (4CX600JA) SK-656
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: (both types) ..... 2.71 in; 68.80 mm
Maximum Diameter: (4CX600J) ..... 2.08 in; 52.80 mm
  (4CX600JA) ..... 2.52 in; 64.00 mm
Weight (approximate)
  (4CX600J) ..... 7.7 oz; 218 gm
  (4CX600JA) ..... 9.0 oz; 255 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier up to 30 MHz	3000	0.60	2500	350	0.68†	—	1100‡
AB	AF Amplifier or Modulator	3000	0.60	2800	350	1.1*	—	1985*

*Two tubes.
†1-tone value; 2-tone $I_b \approx 0.475A$
‡Useful power output; intermodulation distortion products ≈ −40 dB in circuit with 11Ω unbypassed cathode resistor.

4CX600JB



The 4CX600JB is the lower priced version of the highly linear 4CX600J. This type is recommended when operation is to be Class AB_1 or when extra drive power is available for AB_2 operation.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 600 watts
Screen Dissipation (Max.) ..... 15 watts
Grid Dissipation (Max.) ..... 1 watt
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 5.4 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 50 pF
  Output ..... 6.3 pF
  Feed-through ..... .13 pF
Base ..... 9-pin Special
Recommended Air-System Socket SK-607
Recommended Air Chimney SK-646
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.71 in; 68.8 mm
Maximum Diameter: ..... 2.08 in; 52.8 mm
Weight (approximate) ..... 7.7 oz; 218 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	3000	0.60	2000	350	0.50	—	550
AB_1	RF Linear Amplifier	3000	0.60	2800	350	0.57	—	975

4CX1000A/8168

The 4CX1000A/8168 is a low-voltage, high-current tetrode specifically designed for Class AB_1 RF linear-amplifier or audio-amplifier applications where its high gain may be used to advantage.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 0 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 9.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 81.0 pF
  Output ..... 11.8 pF
  Feed-through ..... 0.015 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 35.5 pF
  Output ..... 12.0 pF
  Feed-through ..... 0.004 pF
Transconductance† ..... 37,000 μmhos
Base ..... Special, Breechblock
Recommended Air-System Socket SK-800B
Recommended Air Chimney SK-806
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.80 in; 122.00 mm
Maximum Diameter: ..... 3.37 in; 85.50 mm
Weight (approximate) ..... 27 oz; 0.77 kg
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier at 30 MHz	3000	1.0	3000	325	0.88	—	1630
AB_1	AF Amplifier or Modulator	3000	1.0	3000	325	1.8*	—	3260*

*Two tubes.
†At I_b = 1.0 A.

4CX1000K/8352

The 4CX1000K/8352 is a low-voltage, high-current tetrode, specifically designed for Class AB_1 RF linear-amplifier applications where its high gain and low distortion characteristics may be used to advantage. The 4CX1000K/8352 is similar to the 4CX1000A/8168 but contains a solid screen ring that improves isolation between input and output circuits and permits use of the tube in UHF service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 0 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 9.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 84.0 pF
  Output ..... 13.3 pF
  Feed-through ..... 0.015 pF
Capacitances (Gnd. Cath. Connection):
  Input ..... 35.0 pF
  Output ..... 13.3 pF
  Feed-through ..... 0.003 pF
Transconductance† ..... 37,000 μmhos
Base ..... Special, Breechblock
Recommended Air-System Socket ..... SK-820 or SK-830
Recommended Air Chimney SK-806
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.80 in; 122.00 mm
Maximum Diameter: ..... 3.37 in; 85.50 mm
Weight (approximate) ..... 27 oz; 0.77 kg
Operating Position ..... Any

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	3000	1.0	3000	325	0.88	—	1630
AB_1	AF Amplifier or Modulator	3000	1.0	3000	325	1.80*	—	3260*

*Two tubes.
†At I_b = 1.0 A.

4CX1500A

The 4CX1500A is a general purpose tetrode for use up to and through VHF. Insulation is ceramic and the thoriated tungsten filament is a rugged mesh design. The screen terminal is a continuous ring which allows good isolation between the plate circuit and the control grid circuit.

The 4CX1500A is recommended for use as a Class C power amplifier, Class B or Class AB_1 linear amplifier as a regulator, and in pulse modulator service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1500 watts
Screen Dissipation (Max.) ..... 75 watts
Grid Dissipation (Max.) ..... 25 watts
Frequency for Max. Ratings (CW) ..... 150 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 5.0 volts
  Current ..... 38.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 78.0 pF
  Output ..... 10.5 pF
  Feed-through ..... 0.25 pF
Amplification Factor (g_1–g_2) 5.5
Transconductance † ..... 26,000 μmhos
Base ..... Special, Breechblock
Recommended Air-System Socket SK-831
Recommended Air Chimney SK-806
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.90 in; 124.50 mm
Maximum Diameter: ..... 3.37 in; 85.60 mm
Weight (approximate) ..... 36 oz; 850 gm
Operating Position ..... Vertical

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	5000	1.0	4000	500	0.80	3.6	2500
C	RF Amplifier at 220 MHz	3000	1.0	3000	500	1.0	31.5	1500‡
C	RF Amplifier Plate Modulated at 30 MHz	3500	0.8	3400	500	0.90	10	2320
AB	RF Linear Amplifier at 30 MHz	4000	1.0	3900	600	0.75	—	1850
AB	AF Amplifier or Modulator	4000	1.0	3900	600	1.5*	—	3700*

*Two tubes.
†At I_b = 1.0 A.
‡Useful power output.

4CX1500B/8660

The 4CX1500B/8660 is a low-voltage, high-current tetrode specifically designed for exceptionally low intermodulation distortion and low grid interception. The low distortion characteristics make the 4CX1500B/8660 especially suitable for radio-frequency and audio-frequency linear amplifier service.

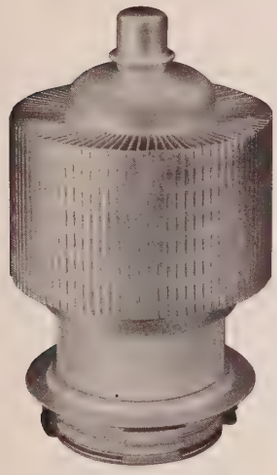
CHARACTERISTICS

Plate Dissipation (Max.) ..... 1500 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 1 watt
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 10.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 81.5 pF
  Output ..... 11.8 pF
  Feed-through ..... 0.02 pF
Transconductance† ..... 30,000 μmhos
Base ..... Special, Breechblock
Recommended Air-System Socket SK-800B
Recommended Air Chimney SK-806
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.80 in; 121.90 mm
Maximum Diameter: ..... 3.37 in; 85.60 mm
Weight (approximate) ..... 27 oz; 0.77 kg
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	3000	0.90	2900	225	0.71	—	1100‡
AB_1	AF Amplifier or Modulator	3000	0.90	2900	325	1.7*	—	2774*

*Two tubes.
†At I_b = 0.5 A.
‡Useful power output.

4CX3000A/8169



The 4CX3000A/8169 is designed to be used as a Class AB_1 linear amplifier in audio or radio-frequency applications. Its characteristics of low intermodulation distortion make it especially suitable for single sideband service.

This tube is unique in that a production test is included to insure minimum distortion products. The 4CX3000A/8169 must produce a minimum of 5300 watts in Class AB_1 service with 3rd order IM distortion at least 32 dB down, from one tone of two-tone signal.

The tube is also recommended for use as a Class C radio-frequency power amplifier and plate-modulated, radio-frequency power amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 3500 watts
Screen Dissipation (Max.) ..... 175 watts
Grid Dissipation (Max.) ..... 50 watts
Frequency for Max. Ratings (CW) ..... 150 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 9.0 volts
  Current ..... 41.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 130 pF
  Output ..... 12.5 pF
  Feed-through ..... 1.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 61.0 pF
  Output ..... 12.5 pF
  Feed-through ..... 0.1 pF
Amplification Factor (g_1-g_2) 5.5
Base ..... Special, Breechblock
Recommended Air-System Socket SK-1400
Recommended Air Chimney SK-1406
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 7.90 in; 200.70 mm
Maximum Diameter: ..... 4.63 in; 117.60 mm
Weight (approximate) ..... 5.5 lb; 2.5 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	7000	2.0	7000	500	1.9	41	11,000
C	RF Amplifier Plate Modulated at 30 MHz	5000	1.4	5000	500	1.4	31	5750
AB	RF Linear Amplifier	7000	2.0	5000	850	1.7	—	5300†
AB	AF Amplifier or Modulator	6000	2.0	6000	850	3.1*	—	12,400*

*Two tubes.
†Useful output power.

4CX5000A/8170

The 4CX5000A/8170 is useful as an oscillator, amplifier, or modulator at frequencies up to 220 MHz, Class AB_1 audio amplifier, or as a screen-modulated radio-frequency amplifier.

The rated plate dissipation is 5 kW for most classes of services and 6 kW for Class AB operation.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	100 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	75.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	115 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Gnd. Grid Connection):	
Input	53.0 pF
Output	20.5 pF
Feed-through	0.1 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	9.13 in; 231.80 mm
Maximum Diameter:	4.94 in; 125.40 mm
Weight (approximate)	9.5 lb; 4.31 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Screen Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Drive Power (watts)	TYPICAL OPERATION: Output Power (watts)
C	RF Amplifier	7500†	3.0†	7500	500	2.8	150	16,000
C	RF Amplifier Plate Modulated	5500	2.5	5000	500	1.4	25	5,800
C	RF Amplifier Screen Modulated	7500	3.0	7500	350	1.1	11	3,550
AB_1	RF Linear Amplifier	7500	4.0	7500	1250	1.9	—	10,000
AB_1	AF Amplifier or Modulator	7500	4.0	7000	1250	3.7*	—	17,500*

*Two tubes.
†Derated values apply above 30 MHz to 220 MHz

4CX5000J/8909

The 4CX5000J/8909 incorporates rugged internal construction features, including a mesh filament.

The 4CX5000J/8909 is specifically designed for exceptionally low intermodulation distortion in radio-frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.)	6000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	100 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten mesh
Voltage	7.5 volts
Current	103 amperes
Capacitances (Gnd. Cath . Connection):	
Input	120.0 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Gnd. Grid Connection):	
Input	56.0 pF
Output	21.5 pF
Feed-through	0.10 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.13 in; 231.80 mm
Maximum Diameter	4.94 in; 125.40 mm
Weight (approximate)	9.5 lb; 4.31 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS: Plate Voltage (volts)	MAXIMUM RATINGS: Plate Current (amps)	TYPICAL OPERATION: Plate Voltage (volts)	TYPICAL OPERATION: Screen Voltage (volts)	TYPICAL OPERATION: Plate Current (amps)	TYPICAL OPERATION: Drive Power (watts)	TYPICAL OPERATION: Output Power (watts)
AB_1	RF Linear Amplifier	7500	4.0	4050	800	1.7	—	3150*

*Useful power output; intermodulation distortion products ≈ −40 dB.

4CX5000R/8170W

The 4CX5000R/8170W incorporates rugged internal construction features including a sturdy mesh filament, which allows it to meet demanding vibration and shock specifications.

The 4CX5000R/8170W is useful up to 110 MHz and is recommended for use as a radio-frequency linear amplifier, a Class AB audio amplifier, or a Class C power amplifier or plate-modulated amplifier.

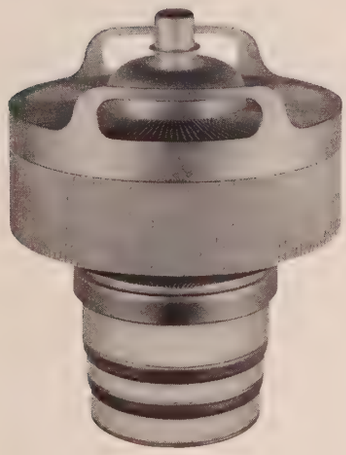
CHARACTERISTICS

Plate Dissipation (Max.) ..... 5000 watts
Screen Dissipation (Max.) ..... 250 watts
Grid Dissipation (Max.) ..... 75 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 7.5 volts
  Current ..... 75.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 115.0 pF
  Output ..... 20.5 pF
  Feed-through ..... 0.7 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 53.0 pF
  Output ..... 21.5 pF
  Feed-through ..... 0.1 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-300A
Recommended Air Chimney SK-306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.13 in; 232.00 mm
Maximum Diameter: ..... 4.94 in; 125.00 mm
Weight (approximate) ..... 9.5 lb; 4.31 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier	7500	3.0	6500	750	2.3	100	10,000†
C	RF Amplifier Plate Modulated	5000	2.5	5000	500	1.4	25	5,800
AB_1	RF Linear Amplifier	7500	4.0	7500	1250	1.9	—	10,000
AB_1	AF Amplifier or Modulator	7500	4.0	7000	1250	3.7*	—	17,500*

*Two tubes.
†Useful output power.

4CX10,000D/8171



The 4CX10,000D/8171 is identical electrically to the 4CX5000A/8170 except for its rated plate dissipation. Its increased dissipation capability, resulting from a larger cooler, is most useful in linear applications where plate dissipation is generally the limiting factor.

The larger cooler also allows the 4CX10,000D/8171 to be used in place of the 4CX5000A/8170 with cooler operation at any given air-flow rate.

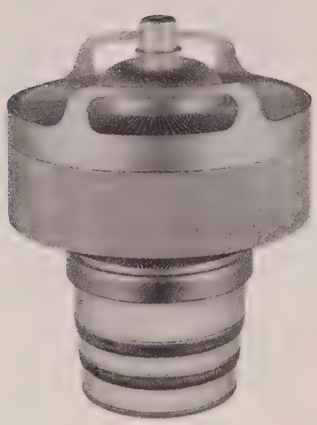
CHARACTERISTICS

Plate Dissipation (Max.) ..... 10,000 watts
Screen Dissipation (Max.) ..... 250 watts
Grid Dissipation (Max.) ..... 75 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 75.0 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 115.0 pF
  Output ..... 20.5 pF
  Feed-through ..... 0.7 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 53.0 pF
  Output ..... 20.5 pF
  Feed-through ..... 0.1 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-300A
Recommended Air Chimney SK-1306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.13 in; 232.00 mm
Maximum Diameter: ..... 7.05 in; 179.00 mm
Weight (approximate) ..... 12.0 lb; 5.50 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Power Amplifier	7500†	3.0†	7500	500	2.8	150	16,000
C	RF Power Amplifier Plate Modulated	5000	2.5	5000	500	1.4	25	5,800
AB_1	RF Linear Amplifier	7500	4.0	7500	1500	3.3	—	15,950
AB_1	AF Amplifier or Modulator	7500	4.0	7500	1500	6.7*	—	31,900*

*Two tubes.
†Derated values apply above 30 MHz.

4CX10,000J



The 4CX10,000J has a rated maximum plate dissipation of 12 kW. It incorporates rugged internal construction features, including a mesh filament.

The 4CX10,000J is specifically designed for exceptionally low intermodulation distortion in radio-frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 12,000 watts
Screen Dissipation (Max.) ..... 250 watts
Grid Dissipation (Max.) ..... 75 watts
Frequency for Max. Ratings (CW) ..... 100 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 7.5 volts
  Current ..... 103 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 120 pF
  Output ..... 20.5 pF
  Feed-through ..... 0.7 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 56.0 pF
  Output ..... 21.5 pF
  Feed-through ..... 0.10 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK300A
Recommended Air Chimney SK-1306
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.13 in; 232.00 mm
Maximum Diameter: ..... 7.05 in; 179.00 mm
Weight (approximate) ..... 12.2 lb; 55.0 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	7500	4.0	7500	1600	2.2	—	10,000*

*Useful output power.

4CX15,000A/8281

The 4CX15,000A/8281 is intended for use in audio or radio frequency applications. It features a new type of internal mechanical structure which results in higher RF operating efficiency. Low RF losses in this mechanical structure permit operation of the 4CX15,000A/8281 at full ratings up to 110 MHz, and at reduced ratings, to 225 MHz.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 15,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 160.5 pF
  Output ..... 24.5 pF
  Feed-through ..... 1.5 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 67.0 pF
  Output ..... 25.5 pF
  Feed-through ..... 0.2 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-300A
Recommended Air Chimney SK-316
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.38 in; 238.00 mm
Maximum Diameter: ..... 7.58 in; 193.00 mm
Weight (approximate) ..... 12.8 lb; 5.80 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	6.0	10,000	750	4.6	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.7	150	23,500
AB_1	RF Linear Amplifier	10,000	6.0	10,000	1500	4.3	—	28,500
AB_1	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,700*

*Two tubes.

4CX15,000J/8910

The 4CX15,000J/8910 is intended for use in audio or radio frequency applications. The internal structure features a mesh filament and a mechanical design which assures good strength and high RF operating efficiency.

Full ratings on the 4CX15,000J/8910 apply to 110 MHz, and it is especially recommended for radio frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 15,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 7.5 volts
  Current ..... 158 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 160.5 pF
  Output ..... 26.5 pF
  Feed-through ..... 1.5 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 67.0 pF
  Output ..... 27.5 pF
  Feed-through ..... 0.2 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-300A
Recommended Air Chimney SK-316
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.38 in; 238.00 mm
Maximum Diameter: ..... 7.58 in; 193.00 mm
Weight (approximate) ..... 12.8 lb; 5.80 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.6	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.7	150	23,500
AB_1	RF Linear Amplifier	10,000	6.0	7,500	1250	2.9	—	12,000†
AB_1	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,000*

*Two tubes.
†Useful output power, −39 dB 3rd and 5th order products.

4CX20,000A/8990

The 4CX20,000A/8990 is a power tetrode intended for use in audio or radio frequency applications. It features an internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 110 MHz and at reduced ratings to 220 MHz.

The 4CX20,000A/8990 has a gain of over 18 dB in FM broadcast service, and is also recommended for radio-frequency linear power amplifier service, and for VHF-TV linear amplifier service. The anode is rated for 20 kW of dissipation with forced-air cooling and incorporates a new highly efficient cooler design.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 140 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 190 pF
  Output ..... 23.5 pF
  Feed-through ..... 1.5 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 83 pF
  Output ..... 24.5 pF
  Feed-through ..... 0.2 pF
Amplification Factor (g_1-g_2) 6.7
Base ..... Special, Coaxial
Recommended Air-System Socket SK-320
Recommended Air Chimney SK-326
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.5 in; 241.3 mm
Maximum Diameter: ..... 8.8 in; 223.5 mm
Weight (approximate) ..... 14 lb; 6.4 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier	10,000	5.0	9,000	900	4.0	26.4*	28,200†
C	RF Amplifier at 88.3 MHz‡	10,000	5.0	9,000	800	4.1	325	28,750**
C	RF Amplifier at 107.7 MHz‡	10,000	5.0	9,000	800	4.2	360	28,900**

*Approximate value.
†Plate output power.
**Useful power, at the load.
‡Measured values at frequency shown, in EIMAC CV-2200 cavity amplifier.

8990A

The 8990A is a version of the 4CX20,000A/8990, especially processed and constructed for use as a high power modulated RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 20,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 140 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 190 pF
  Output ..... 23.5 pF
  Feed-through ..... 1.5 pF
Base ..... Special concentric
Recommended Air-System Socket SK-320
Recommended Air Chimney SK-326
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 9.5 in; 241.3mm
Maximum Diameter: ..... 8.8 in; 223.5 mm
Weight (approximate) ..... 14 lb; 6.36 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier, Plate and Screen Modulated	8000	5	7800	750	4.6	35	29

4CX35,000C/8349

The 4CX35,000/8349 is intended for use at the 50 to 150 kW output power level. It is recommended for use as a Class C RF amplifier or oscillator a Class AB RF linear amplifier, or a Class AB push-pull AM amplifier or modulator.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 35,000 watts
Screen Dissipation (Max.) ..... 1,750 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 295 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 440 pF
  Output ..... 55.0 pF
  Feed-through ..... 2.30 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 175 pF
  Output ..... 57 pF
  Feed-through ..... 0.4 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, graduated rings
Recommended Air-System Socket SK-1500A
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 17.34 in; 440.00 mm
Maximum Diameter: ..... 9.75 in; 248.00 mm
Weight (approximate) ..... 50 lb; 22.70 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	15.0	19,000	750	7.0	258	110,000
C	RF Amplifier Plate Modulated	14,000	15.0	12,000	750	5.4	125	55,000
AB_1	RF Linear Amplifier	20,000	15.0	15,000	1500	5.7	—	55,000
AB_1	AF Amplifier or Modulator	20,000	15.0	12,000	1500	9.2*	—	70,000*

*Two tubes.

4CX40,000G

The 4CX40,000G power tetrode is intended for use in audio or radio frequency applications. It features a high stability pyrolytic graphite grid and a type of internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 220 MHz.

The 4CX40,000G is recommended for FM broadcast service and for VHF TV linear amplifier service. The anode is rated for 40 kW of dissipation with forced-air cooling and incorporates a highly efficient cooler of new design.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 40,000 watts
Screen Dissipation (Max.) ..... 1,500 watts
Grid Dissipation ..... 1,000 watts
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 15.0 volts
  Current ..... 165 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 447 pF
  Output ..... 36 pF
  Feed-through ..... 1.5 pF
Capacitances (Gnd. Grid Connection)
  Input ..... 155 pF
  Output ..... 37 pF
  Feed-through ..... 0.15 pF
Amplification Factor (g_1-g_2) 8
Base ..... Special, graduated rings
Maximum Seals & Anode Core Temperature ..... 250°C
Maximum Length ..... 11.70 in; 29.72 mm
Maximum Diameter ..... 10.06 in; 25.55 mm
Weight (approximate) ..... 55 lb; 25 kg
Operating Position ..... Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	14,000	10.0	10,600	800	7.0	250	60,000

8930

The 8930 is electrically identical to the 4CX250R/7580W but the larger anode radiator assembly allows higher dissipation with low air flow and pressure drop characteristics.

The tube has rugged internal construction features for reliable operation under heavy shock or vibration conditions.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 350 watts
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 2.6 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 17.5 pF
  Output ..... 4.9 pF
  Feed-through ..... 0.03 pF
Amplification Factor (g_1-g_2) 5
Base ..... 9-Pin Special
Recommended Air-System Socket SK-600A
Recommended Air Chimney SK-646
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.46 in; 62.60 mm
Maximum Diameter: ..... 2.08 in; 52.80 mm
Weight (approximate) ..... 5.5 oz; 156 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	2400	0.25	2000	350	0.29†	—	350†
AB_1	RF Linear Amplifier AM Service	2000	0.25	2000	400	0.17‡	4	65‡
AB_1	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.
†1-tone value; 2-tone $I_b \approx 0.20A$.
‡Carrier value; $I_b = 0.20A$ with 90% modulation.

8989

The 8989 is intended for use in audio or radio frequency applications. It features an internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 110 MHz and at reduced ratings to 220 MHz.

The 8989 has a gain of 18 dB in FM broadcast service, and is also recommended for RF linear amplifier service, and for VHF-TV linear amplifier service. The anode is rated for 15 kilowatts of dissipation with forced-air cooling and incorporates a new highly efficient cooler design.

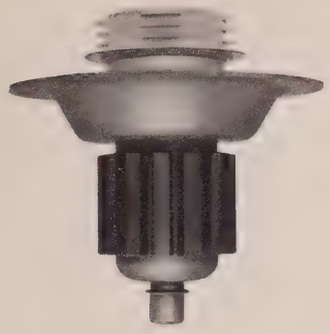
CHARACTERISTICS

Plate Dissipation (Max.)	15.000 watts
Screen Dissipation (Max.)	300 watts
Grid Dissipation (Max.)	150 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	120 amperes
Capacitances (Gnd. Cath. Connection):	
Input	160 pF
Output	18.5 pF
Feed-through	1.0 pF
Capacitances (Gnd. Grid Connection):	
Input	70 pF
Output	18. 6 pF
Feed-through	0.1 pF
Amplification Factor (g_1-g_2)	6.7
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-336
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	9.84 in; 24.99 mm
Maximum Diameter:	7.76 in; 19.71 mm
Weight (approximate)	14 lb; 6.4 kg.
Operating Position	Vertical, base up or down

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	3.5	9,000	750	2.83	23*	20,000‡
C	RF Amplifier at 90.5 MHz§	10,000	3.5	8,000	750	1.6	165	11,000†
C	RF Amplifier at 108.1 MHz§	10,000	3.5	8,000	800	2.58	250	15,800†

*Approximate value.
†Useful power, at the load.
‡Plate output power.
§Measured values at frequency shown, in EIMAC cavity amplifier.

4CV8000A



The 4CV8000A is designed to be used as a Class AB_1 linear amplifier in audio or radio-frequency applications. Its characteristic of low intermodulation distortion makes it specially suitable for single-sideband service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 8,000 watts
Screen Dissipation (Max.) ..... 175 watts
Grid Dissipation (Max.) ..... 50 watts
Frequency for Max. Ratings (CW) ..... 150 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 9.0 volts
  Current ..... 41.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 130 pF
  Output ..... 12.5 pF
  Feed-through ..... 0.8 pF
Amplification Factor (g_1-g_2) 5.5
Base ..... Special Ring and Breechblock Terminal Surfaces
Recommended Air-System Socket SK-1490
Recommended Boiler BR-101
Maximum Seal Temperature ..... 250°C
Maximum Anode Flange Temperature ..... 110°C
Maximum Length: (less Boiler) ..... 7.98 in; 202.70 mm
Maximum Diameter: (less Boiler) ..... 7.87 in; 199.90 mm
Weight (approximate) (less Boiler) ..... 7.0 lb; 3.2 kg.
Operating Position ..... Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	7000	2.0	7000	500	1.9	47	11,000
C	RF Amplifier Plate Modulated at 30 MHz	5000	1.4	5000	400	1.3	42	5,500
AB_1	RF Linear Amplifier at 30 MHz	7000	2.0	6000	850	2.0	—	7,250
AB_1	AF Amplifier or Modulator	7000	2.0	6000	850	4.0*	—	14,500*

*Two tubes.

4CV35,000A

The 4CV35,000A is a vapor-cooled power tetrode recommended for Class AB audio-frequency and radio-frequency amplifier service. The anode is rated for 35 kW of dissipation, making the tube attractive for low efficiency operation.

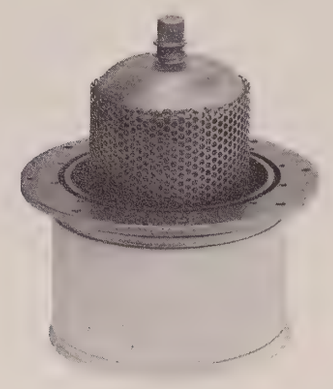
CHARACTERISTICS

Plate Dissipation (Max.) ..... 35,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 161 pF
  Output ..... 24.5 pF
  Feed-through ..... 1.5 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-310
Recommended Boiler BR-200
Maximum Seal Temperature ..... 250°C
Maximum Length: (less Boiler) ..... 9.50 in; 241.30 mm
Maximum Diameter: (less Boiler) ..... 7.75 in; 196.80 mm
Weight (approximate) (less Boiler) ..... 20 lb; 9.1 kg.
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.8	225	38,000
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.6	150	23,500
AB_1	RF Linear Amplifier	10,000	6.0	10,000	1500	5.3	—	33,000
AB_1	AF Amplifier or Modulator	10,000	6.0	10,000	1500	10.7*	—	66,000*

*Two tubes.

4CV50,000E



The 4CV50,000E is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CV50,000E is also useful as a plate and screen modulated Class C RF amplifier.

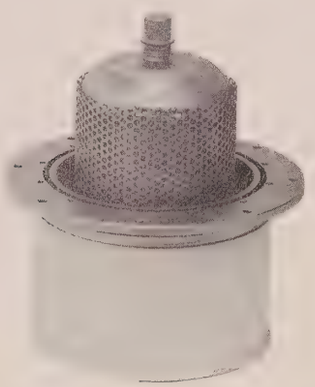
CHARACTERISTICS

Plate Dissipation (Max.) ..... 50,000 watts
Screen Dissipation (Max.) ..... 1,500 watts
Grid Dissipation (Max.) ..... 400 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 12.0 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 310.0 pF
  Output ..... 52.0 pF
  Feed-through ..... 0.7 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special
Recommended Air-System Socket SK-2011A
Recommended Boiler BR-710A
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: (less Boiler) ..... 11.50 in; 292.10 mm
Maximum Diameter: (less Boiler) ..... 9.53 in; 242.00 mm
Weight (approximate) (less Boiler) ..... 31.5 lb; 14.3 kg.
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	17,500	12.0	15,000	1500	11.5	150	137,000
C	RF Amplifier Plate Modulated	15,000	12.0	14,000	750	9.25	685	110,000
AB_1	RF Linear Amplifier	17,500	12.0	10,000	1800	9.14	—	57,000
AB_1	AF Amplifier or Modulator	17,500	12.0	15,000	1250	18.6*	—	195,000*

*Two tubes.

4CV50,000J



The 4CV50,000J is a vapor-cooled power tetrode intended for use at the 50 to 100 kW output power level. This tube is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a class AB_1 RF linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 50,000 watts
Screen Dissipation (Max.) ..... 1,500 watts
Grid Dissipation (Max.) ..... 400 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 12.0 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 320.0 pF
  Output ..... 48.0 pF
  Feed-through ..... 1.0 pF
Amplification Factor (g_1–g_2) 4.5
Base ..... Special
Recommended Air-System Socket SK-2011A
Recommended Boiler BR-710A
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: (less Boiler) ..... 11.50 in; 292.10 mm
Maximum Diameter: (less Boiler) ..... 9.53 in; 242.00 mm
Weight (approximate) (less Boiler) ..... 31.5 lb; 14.3 kg.
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	RF Linear Amplifier	17,500	12.0	8300	1500	9.8	—	45,000

4CV100,000C/8351

The 4CV100,000C/8351 is recommended for use as a Class C RF amplifier or oscillator, a Class AB, RF linear amplifier or a Class AB, push-pull AF amplifier or modulator. The 4CV100,000C/8351 is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 100,000 watts
Screen Dissipation (Max.) ..... 1,750 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 300 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 440 pF
  Output ..... 55.0 pF
  Feed-through ..... 2.3 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 175 pF
  Output ..... 57.0 pF
  Feed-through ..... 0.4 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Graduated Rings
Recommended Air-System Socket SK-1500A
Recommended Boiler BR-300
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: (less Boiler) ..... 17.24 in; 437.90 mm
Maximum Diameter: (less Boiler) ..... 10.07 in; 255.80 mm
Weight (approximate) (less Boiler) ..... 68 lb; 30.9 kg.
Operating Position ..... Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	15.0	17,500	1500	11.8	125	168,000
C	RF Amplifier Plate Modulated	17,500	15.0	16,000	750	12.0	1260	138,500†
C	RF Amplifier Plate Modulated (Cathode Driven)	17,500	15.0	15,000	900	11.6	8100	141,000†
AB_1	RF Linear Amplifier	20,000	15.0	18,000	1500	10.0	—	123,200
AB_1	AF Amplifier or Modulator	20,000	15.0	18,000	1500	20.0*	—	246,400*

*Two tubes.
†Carrier conditions.

4CV250,000B

The 4CV250,000B is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CV250,000B is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 250,000 watts
Screen Dissipation (Max.) ..... 3,500 watts
Grid Dissipation (Max.) ..... 1,500 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Vapor and Water
Filament ..... Thoriated tungsten
  Voltage ..... 12.0 volts
  Current ..... 660 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 745 pF
  Output ..... 124 pF
  Feed-through ..... 6.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 324 pF
  Output ..... 128 pF
  Feed-through ..... 1.2 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special
Filament Connectors SK-1710
Grid Connectors SK-1712
Recommended Boiler BR-620
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: (less Boiler) ..... 28.02 in; 17.17 cm
Maximum Diameter: (less Boiler) ..... 15.06 in; 38.26 cm
Weight (approximate): (less Boiler) ..... 180 lb; 82 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	40.0	19,000	800	32.5	3000	460,000
C	RF Amplifier Plate Modulated	17,500	30.0	15,000	800	22.8	1630	280,000†
AB_1	RF Linear Amplifier	20,000	40.0	20,000	1800	23.0	—	330,000
AB_1	AF Amplifier or Modulator	20,000	40.0	20,000	1800	46.0*	—	660,000*

*Two tubes.
†Carrier conditions.

X-2203B

The X-2203B is a power tetrode with pyrolytic graphite control and screen grids, for applications requiring tube outputs of 300 kW and above.

The tube is characterized by low input and feedback capacitances and low internal lead inductances. Its rugged mesh thoriated-tungsten filament provides ample emission for long operating life.

The water-vapor cooled anode is rated for 300 kW of dissipation. The pyrolytic grids have high dissipation ratings and low secondary emission characteristics.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 300,000 watts
Screen Dissipation (Max.) ..... 6,000 watts
Grid Dissipation ..... 2,000 watts
Frequency for Max. Ratings (CW) ..... 50 MHz
Cooling ..... Water-Vapor and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 15.0 volts
  Current ..... 575 amperes
Capacitances (Gnd. Cath. Connection)
  Input ..... 600 pF
  Output ..... 90 pF
  Feed-through ..... 1.0 pF
Base ..... Special
Recommended Air System Socket SK-2400
Maximum Seals & Anode Core Temperature ..... 200 C
Maximum Length ..... 22.50 In; 571.36 mm
Maximum Diameter ..... 11.80 In; 299.64 mm
Net Weight (approximate) ..... 55.0 Lb; 25.0 kg
Operating Position ..... Vertical, base up

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Power Amplifier up to 30 MHz	20,000	50	11,000	1000	35.2	1440	301,000

4CW800B, 4CW800F

The 4CW800B and 4CW800F are designed for use in distributed amplifiers and VHF/UHF power amplifiers.

The mechanical and electrical features of these tubes are compatible with distributed amplifier circuit requirements; i.e., low lead inductance, low input and output capacitance and small size.

Ruggedized construction consisting of a unitized electrode structure and direct mounting to the chassis, combine to make the 4CW800B and 4CW800F suitable for environments of severe shock and vibration.

Anode water fittings not supplied.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 800 watts
Screen Dissipation (Max.) ..... 15 watts
Grid Dissipation (Max.) ..... 3 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Water
Cathode ..... Oxide-coated Unipotential
  Voltage (4CW800B) ..... 6.0 volts
  (4CW800F) ..... 26.5 volts
  Current (4CW800B) ..... 4.4 amperes
  (4CW800F) ..... 1.1 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 45.0 pF
  Output ..... 5.8 pF
  Feed-through ..... 0.15 pF
Input Conductance (I_b = 600 mAdc) ..... 0.1 x 10^{-3} mhos
Transconductance†† ..... 40,000 μmhos
Base ..... Special
Recommended screen bypass capacitor SK-680
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 3.00 in; 76.20 mm
Maximum Diameter: ..... 2.03 in; 51.60 mm
Weight (approximate) ..... 7 oz; 198.0 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
B	RF Linear Amplifier at 140–250 MHz	3000	0.6	2500	300	0.60	—	820*
B	RF Linear Amplifier at 432 MHz	3000	0.6	2000	300	0.60	†	770*
B	RF Linear Amplifier at 865 MHz	3000	0.6	2000	300	0.60	‡	550*
AB	RF Linear Amplifier, Broadband Service	3000	0.6	2500	275	0.58	—	1000

*Useful Output power.
†Power Gain approx. 15.3 dB at 432 MHz.
‡Power Gain approx. 9 dB at 865 MHz.
††At I_b = 0.6 A

4CW25,000A

The 4CW25,000A is a tetrode intended for use in audio or radio frequency applications. It is recommended for RF linear power amplifier service for television linear amplifier service, and as a switch tube for pulsed regulator service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 25,000 watts
Screen Dissipation (Max.) ..... 450 watts
Grid Dissipation (Max.) ..... 200 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 6.3 volts
  Current ..... 160 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 160 pF
  Output ..... 24.5 pF
  Feed-through ..... 1.5 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 67 pF
  Output ..... 25.5 pF
  Feed-through ..... 0.2 pF
Amplification Factor (g_1–g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-300A
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 12.69 in; 322.00 mm
Maximum Diameter: ..... 4.75 in; 121.00 mm
Weight (approximate) ..... 13.5 lb; 6.1 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.5	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.6	150	23,500
AB_1	RF Linear Amplifier	10,000	6.0	10,000	1500	4.2	—	28,500
AB_1	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,000*

*Two tubes.

4CW50,000E

The 4CW50,000E is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CW50,000E is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 50,000 watts
Screen Dissipation (Max.) ..... 1,500 watts
Grid Dissipation (Max.) ..... 400 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 12.0 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 310 pF
  Output ..... 52.0 pF
  Feed-through ..... 0.7 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 140 pF
  Output ..... 52.0 pF
  Feed-through ..... 0.3 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Air-System Socket SK-2011A
Recommended Water Jacket SK-2050A
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 11.50 in; 292.00 mm
Maximum Diameter: ..... 9.53 in; 242.00 mm
Weight (approximate) ..... 35.0 lb; 15.9 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	17,500	12.0	15,000	1500	11.5	150	137,000
C	RF Amplifier Plate Modulated	15,000	12.0	14,000	750	9.2	685	110,000
AB_1	RF Linear Amplifier	17,500	12.0	10,000	1800	9.1	—	57,000
AB_1	AF Amplifier or Modulator	17,500	12.0	15,000	1250	18.6*	—	195,000*

*Two tubes.

4CW50,000J

The 4CW50,000J is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class AB_1 RF linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 50,000 watts
Screen Dissipation (Max.) ..... 1,500 watts
Grid Dissipation (Max.) ..... 300 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 12.0 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 310 pF
  Output ..... 48.0 pF
  Feed-through ..... 1.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 123 pF
  Output ..... 50.0 pF
  Feed-through ..... 0.3 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, coaxial
Recommended Air-System Socket SK-2011A
Recommended Water Jacket SK-2050
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 11.50 in; 292.00 mm
Maximum Diameter: ..... 9.53 in; 242.00 mm
Weight (approximate) ..... 35 lb; 15.9 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	17,500	12.0	8300	1500	9.8	—	45,000

4CW100,000D

The 4CW100,000D is recommended for use as a Class C RF amplifier or oscillator, a Class AB, RF linear amplifier or a Class AB, push-pull AF amplifier or modulator. The 4CW100,000D is also useful as a plate and screen modulated Class C RF amplifier, and in pulse modulator-regulator service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 100,000 watts
Screen Dissipation (Max.) ..... 1,750 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 295 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 440 pF
  Output ..... 55.0 pF
  Feed-through ..... 2.3 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 175 pF
  Output ..... 57.0 pF
  Feed-through ..... 0.4 pF
Amplification Factor ($g_1 - g_2$) 4.5
Base ..... Special Graduated Rings
Recommended Air-System Socket SK-1500A
Recommended Water Jacket ..... Integral
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 18.00 in; 457.00 mm
Maximum Diameter: ..... 8.00 in; 203.00 mm
Weight (approximate) ..... 60.0 lb; 27.2 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	15.0	19,000	750	10.0	1165	165
C	RF Amplifier Plate Modulated	17,500	15.0	16,000	750	10.0	870	138
AB_1	RF Linear Amplifier	20,000	15.0	18,000	1500	10.0	—	123
AB_1	AF Amplifier or Modulator	20,000	15.0	18,000	1500	20.0*	—	246*
—	Switch Tube or Pulse Modulator	40,000	200†	38,000	1500	112‡	16,800‡	3600‡

*Two tubes.
†Pulse cathode current.
‡Pulse value.

4CW100,000E

The 4CW100,000E is ideal for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier, or a Class AB push-pull AF amplifier or modulator as well as a plate- and screen-modulated Class C RF amplifier. In pulse-modulator service, it can deliver a peak output of 4 megawatts. The tube is characterized by low input and feedback capacitances and low internal lead inductances.

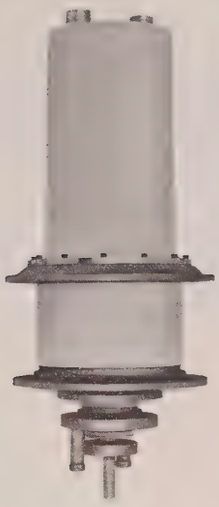
CHARACTERISTICS

Plate Dissipation (Max.) ..... 100,000 watts
Screen Dissipation (Max.) ..... 1,750 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 108 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 15.5 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 370 pF
  Output ..... 60.0 pF
  Feed-through ..... 1.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 175 pF
  Output ..... 60.0 pF
  Feed-through ..... 0.35 pF
Base ..... Special, Coaxial
Recommended Air-System Socket SK-2011A
Recommended Water Jacket SK-2100
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 12.82 in; 325.60 mm
Maximum Diameter: ..... 9.53 in; 242.10 mm
Weight (approximate) (tube only) ..... 38.5 lb; 17.5 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	16.0	20,000	1500	15.2	120	220
C	RF Amplifier Plate Modulated	17,500	16.0	15,000	750	11.7	530	140
AB_1	RF Linear Amplifier	20,000	16.0	18,000	1500	13.5	—	168
AB_1	AF Amplifier or Modulator	20,000	16.0	15,000	1500	19.5*	—	200*

*Two tubes.

4CW250,000B



The 4CW250,000B is recommended as a Class C amplifier or oscillator; a Class AB RF linear amplifier; a Class AB push-pull AF linear amplifier or modulator; a plate or screen modulated Class C RF amplifier; or for pulse modulator or regulator service. Water jacket not included.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 250,000 watts
Screen Dissipation (Max.) ..... 3,500 watts
Grid Dissipation (Max.) ..... 1,500 watts
Frequency for Max. Ratings (CW) ..... 50 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 12.0 volts
  Current ..... 660 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 745 pF
  Output ..... 124 pF
  Feed-through ..... 6.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 324 pF
  Output ..... 128 pF
  Feed-through ..... 1.2 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special
Recommended Filament Connector SK-1710
Recommended Grid Connector SK-1712
Recommended Anode Water Jacket SK-1720
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 27.65 in; 70.23 cm
Maximum Diameter: ..... 13.06 in; 33.17 cm
Weight (approximate) (tube only) ..... 98.0 lb; 44.5 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	40.0	19,000	800	32.5	3000	460
C	RF Amplifier Plate Modulated	17,500	30.0	14,000	800	29.0	2320	285
AB_1	RF Linear Amplifier	20,000	40.0	20,000	1800	23.0	—	330
AB_1	AF Amplifier or Modulator	20,000	40.0	20,000	1800	46.0*	—	660*

*Two tubes.

8959

The 8959 is designed for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier, or a Class AB push-pull audio amplifier or modulator, as well as a plate and screen modulated Class C RF amplifier.

In pulse modulator service it can deliver a peak output of 4 megawatts.

The tube is characterized by low input and feedback capacitances and low internal lead inductances. Its rugged mesh thoriated tungsten filament provides ample emission for long operating life.

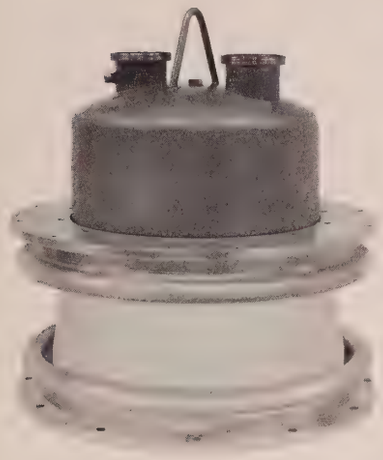
CHARACTERISTICS

Plate Dissipation (Max.) ..... 100,000 watts
Screen Dissipation (Max.) ..... 1,750 watts
Grid Dissipation (Max.) ..... 500 watts
Frequency for Max. Ratings (CW) ..... 108 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 15.5 volts
  Current ..... 215 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 370 pF
  Output ..... 60.0 pF
  Feed-through ..... 1.0 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 175 pF
  Output ..... 60.0 pF
  Feed-through ..... 0.35 pF
Base ..... Special, Coaxial
Recommended Air-System Socket SK-2011A
Maximum Seal & Envelope Temperature ..... 250°C
Maximum Length: ..... 12.57 in; 319.30 mm
Maximum Diameter: ..... 8.26 in; 209.80 mm
Weight (approximate) ..... 38.5 lb; 17.5 kg.
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	16.0	20,000	1500	15.2	120	220
C	RF Amplifier Plate Modulated	17,500	16.0	15,000	750	11.7	530	140
AB_1	RF Linear Amplifier	20,000	16.0	18,000	1500	13.5	—	168
AB_1	AF Amplifier or Modulator	20,000	16.0	15,000	1500	19.5*	—	200*
—	Switch Tube or Pulse Modulator	40,000	200†	40,000	2500	110	—	4100

*Two tubes.
†Cathode current, pulse.

8973/X-2170



The 8973/X-2170 is a power tetrode designed for very-high-powered medium-frequency or high-frequency broadcast service and very-low-frequency communication in the half-megawatt power range.

The 8973/X-2170 has a thoriated-tungsten filament mounted on water-cooled supports.

The maximum anode dissipation rating is 650 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 650,000 watts
Screen Dissipation (Max.) ..... 7,500 watts
Grid Dissipation (Max.) ..... 2,000 watts
Frequency for Max. Ratings (CW) ..... 70 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 18.5 volts
  Current ..... 650 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 1000 pF
  Output ..... 165 pF
  Feed-through ..... 5.0 pF
Amplification Factor (g_1-g_2) 4.5
Base ..... Special, Coaxial
Recommended Filament Power/Water:
  Connectors (2 required) SK-2310
Recommended Filament RF:
  Connector (1 required) SK-2315
Recommended Anode Water:
  Connectors (2 required) SK-2320
  or SK-2321 or SK-2322
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 18.75 in; 476.20 mm
Maximum Diameter: ..... 17.03 in; 432.60 mm
Weight (approximate) ..... 153.0 lb; 69.5 kg.
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	22,500	65.0	21,000	1500	63.0	400	1050†
C	RF Amplifier Plate Modulated‡	17,500	50.0	17,500	800	50.0	2400	700†
AB_1	RF Linear Amplifier	22,500	65.0	20,000	1500	45.0	—	610†
AB_1	AF Amplifier or Modulator	22,500	65.0	17,500	1500	78.0*	—	950*†

*Two tubes.
†Plate power output.
‡Carrier conditions.

8974/X-2159

The 8974/X2159 is a power tetrode designed for very-high-powered medium-frequency or high-frequency broadcast service and very-low-frequency communication in the megawatt power range.

The 8974/X-2159 has a two-section thoriated tungsten filament mounted on water-cooled supports. The two sections may be fed in quadrature to reduce hum contributed by an ac power source. The maximum anode dissipation rating is 1250 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through three special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1,250 kW
Screen Dissipation (Max.) ..... 15 kW
Grid Dissipation (Max.) ..... 4.0 kW
Frequency for Max. Ratings (CW) ..... 30 MHz
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten, two-section
  Voltage ..... 18.5 volts
  Current ..... 650 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 1600 pF
  Output ..... 250 pF
  Feed-through ..... 6 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 675 pF
  Output ..... 260 pF
  Feed-through ..... 1.0 pF
Amplification Factor (g_1-g_2) 4.5
Base Terminals ..... Special, Coaxial
Recommended Filament Power/Water:
  Connectors (3 required) SK-2310
Recommended Filament RF:
  Connector (1 required) SK-2315
Recommended Anode Water:
  Connectors (2 required) SK-2320
  or SK-2321 or SK-2322
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 23.75 in; 60.30 cm
Maximum Diameter: ..... 17.03 in; 43.30 cm
Weight (approximate) ..... 175.0 lb; 80.0 kg.
Operating Position ..... Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	22,500	125	21,500	1000	125	7000	2158†
C	RF Amplifier Plate Modulated‡	17,500	100	17,500	1000	95.0	6465	1384†
AB_1	RF Linear Amplifier	22,500	125	20,000	1500	86.5	—	1225†
AB_1	AF Amplifier or Modulator	22,500	125	17,500	1500	146*	—	2015*†

*Two tubes.
†Plate power output.
‡Carrier conditions.

9008/X-2062J

The 9008/X-2062J is a water-cooled power tetrode intended for use as a pulse modulator or in pulse regulator service.

The tube is rated for 100 kVdc hold-off in a protective atmosphere, with a 90 amperes pulse cathode current rating during conduction and a 300 kW anode dissipation rating (average during the pulse).

Peak anode current capability in excess of 150 amperes for short pulse operation is practical.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 300,000 watts
Screen Dissipation (Max.) ..... 3,500 watts
Grid Dissipation (Max.) ..... 1,500 watts
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 12.0 volts
  Current ..... 660 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 7.2 pF
  Output ..... 2.25 pF
  Feed-through ..... 4.0 pF
Amplification Factor (g_1-g_2) 4.5
Recommended SF-6 Containment Hood SK-2316
Base ..... Special
Recommended Connectors:
  Filament (2 required) SK-1710
  Control Grid (1 required) SK-1712
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 28.8 in; 73.15 cm
Maximum Diameter: ..... 12.0 in; 30.48 cm
Weight (approximate) ..... 98 lb; 44.5 kg.
Operating Position ..... Vertical only

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Switch Tube (Maximum regulation range 20 kv)	100,000	90	—	—	—	—	—
—	Pulse Modulator	100,000	90†	83,000*	1000	80	—	6400‡

*Anode voltage during conduction = 3000 volts.
†Peak cathode current.
‡Peak power to the load.

9009/X-2062K

The 9009/X-2062K is a water-cooled power tetrode intended for use as a pulse modulator or in pulse regulator service.

The tube is rated for 150 kVdc hold-off in a protective atmosphere, with a 90 amperes pulse cathode current rating during conduction and a 1000 kilowatt anode dissipation rating (average during the pulse).

Peak anode current capability in excess of 150 amperes for short pulse operation is practical.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1,000,000 watts
Screen Dissipation (Max.) ..... 3,500 watts
Grid Dissipation (Max.) ..... 1,500 watts
Cooling ..... Water and Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 12.0 volts
  Current ..... 660 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 770 pF
  Output ..... 50 pF
  Feed-through ..... 4.0 pF
Amplification Factor (g_1-g_2) 4.5
Recommended SF-6 Containment Hood SK-2306
Base ..... Special
Recommended Connectors:
  Filament (2 Required) SK-1710
  Control Grid (1 Required) SK-1712
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 30.25 in; 76.84 cm
Maximum Diameter: ..... 17.00 in; 43.18 cm
Weight (approximate) ..... 175 lb; 80 kg.
Operating Position ..... Vertical only

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Switch Tube (Maximum regulation range 20 Kv)	150,000	90†	—	—	—	—	—
—	Pulse Modulator	150,000	90†	120,000*	1500	50	—	4600‡

*Anode voltage during conduction = 4000 volts.
†Peak cathode current.
‡Peak power to the load.

4-65A/8165

The 4-65A/8165 is a small radial-beam tetrode. In most applications, no forced air is required, normal radiation and convection cooling being adequate.

Short, heavy leads and low inter-electrode capacities permit its use at maximum ratings through 150 MHz.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 65 watts
Screen Dissipation (Max.) ..... 10 watts
Grid Dissipation (Max.) ..... 5 watts
Frequency for Max. Ratings (CW) ..... 150 MHz
Cooling ..... Convection & Radiation
Filament ..... Thoriated Tungsten
  Voltage ..... 6.0 volts
  Current ..... 3.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 7.1 pF
  Output ..... 2.3 pF
  Feed-through ..... 0.1 pF
Amplification Factor (g_1-g_2) 6
Base ..... 5-Pin Special
Recommended Heat Dissipating Connector HR-6
Maximum Seal Temperature ..... 200°C
Maximum Envelope Temperature ..... 225°C
Maximum Length: ..... 4.37 in; 111.00 mm
Maximum Diameter: ..... 2.36 in; 60.40 mm
Weight (approximate) ..... 3 oz; 85.0 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	0.15	3000	250	0.11	1.6	270
C	RF Amplifier Plate Modulated	2500	0.12	2500	250	0.10	3.1	210
AB_1	RF Linear Amplifier	3000	0.15	3000	400	0.06	—	120
AB_1	AF Amplifier or Modulator	3000	0.15	3000	400	0.12*	—	240*

*Two tubes.

4-125A/4D21

The 4-125A/4D21 is intended for use as an amplifier, oscillator, or modulator. It has a maximum plate voltage rating of 3 kV at frequencies up to 120 MHz.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 125 watts
Screen Dissipation (Max.) ..... 20 watts
Grid Dissipation (Max.) ..... 5 watts
Frequency for Max. Ratings (CW) ..... 120 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 5.0 volts
  Current ..... 6.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 10.8 pF
  Output ..... 3.1 pF
  Feed-through ..... 0.05 pF
Amplification Factor (g_1-g_2) 5.9
Base ..... 5-Pin Special
Recommended Air-System Socket SK-410
Recommended Heat Dissipating Connector HR-6
Maximum Seal Temperature ..... 200°C
Maximum Envelope Temperature ..... 225°C
Maximum Length: ..... 5.69 in; 144.50 mm
Maximum Diameter: ..... 2.81 in; 71.40 mm
Weight (approximate) ..... 6.5 oz; 184.0 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	0.22	3000	350	0.17	2.5	375
C	RF Amplifier Plate Modulated	2500	0.20	2500	350	0.15	3.3	300
AB_1	AF Amplifier or Modulator	3000	0.22	2500	600	0.23*	—	330*
AB_2	AF Amplifier or Modulator	3000	0.22	2500	350	0.26*	2.4	400*

*Two tubes.

4-250A/5D22

The 4-250A/5D22 is intended for use as an amplifier, oscillator or modulator. The low grid-plate capacitance of this tetrode coupled with its low driving-power requirement allows considerable simplification of the associated circuit and driver stage.

The 4-250A/5D22 is cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal.

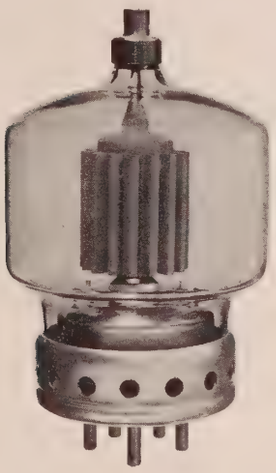
CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 35 watts
Grid Dissipation (Max.) ..... 10 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 5.0 volts
  Current ..... 14.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 12.7 pF
  Output ..... 4.5 pF
  Feed-through ..... 0.12 pF
Amplification Factor (g_1-g_2) 5.1
Transconductance† ..... 4000 μmhos
Base ..... 5-Pin Special
Recommended Air-System Socket SK-410
Recommended Air Chimney SK-406
Recommended Heat Dissipating Connector HR-6
Maximum Plate Seal Temperature ..... 200°C
Maximum Base Seal Temperature ..... 170°C
Maximum Length: ..... 6.38 in; 162.00 mm
Maximum Diameter: ..... 3.56 in; 90.40 mm
Weight (approximate) ..... 8 oz; 227 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	4000	0.35	4000	500	0.31	2.5	1000
C	RF Amplifier Plate Modulated	3200	0.27	3000	400	0.23	3.2	510
AB_1	RF Linear Amplifier	4000	0.35	3000	600	0.20	—	350
AB_1	AF Amplifier or Modulator	4000	0.35	3000	600	0.42*	—	750*
AB_2	AF Amplifier or Modulator	4000	0.35	3000	300	0.47*	4.6	1040*

*Two tubes.
†At I_b = 100 mA.

4-400A/8438



The 4-400A/8438 is intended for use as an amplifier, oscillator or modulator. The low grid-plate capacitance of this tetrode coupled with its low driving-power requirement allows considerable simplification of the associated circuit and driver stage.

The 4-400A/8438 is cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal. Cooling can be greatly simplified by using an EIMAC SK-410 Air-System Socket and its accompanying glass chimney.

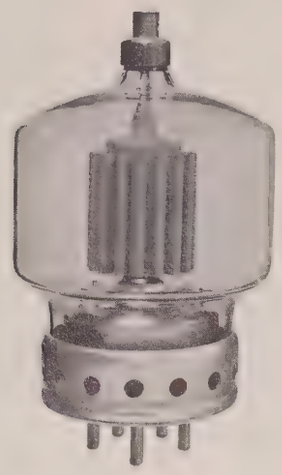
CHARACTERISTICS

Plate Dissipation (Max.) ..... 400 watts
Screen Dissipation (Max.) ..... 35 watts
Grid Dissipation (Max.) ..... 10 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 5.0 volts
  Current ..... 14.7 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 12.5 pF
  Output ..... 4.7 pF
  Feed-through ..... 0.12 pF
Amplification Factor (g_1-g_2) 5.1
Transconductance† ..... 4000 μmhos
Base ..... 5-Pin Special
Recommended Air-System Socket SK-410
Recommended Air Chimney SK-406
Recommended Heat Dissipating Connector HR-6
Maximum Plate Seal Temperature ..... 225°C
Maximum Base Seal Temperature ..... 200°C
Maximum Length: ..... 6.38 in; 162.00 mm
Maximum Diameter: ..... 3.56 in; 90.40 mm
Weight (approximate) ..... 9.0 oz; 225 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 75 MHz	4000	0.35	4000	500	0.35	5.8	1100
C	RF Amplifier at 110 MHz	4000	0.35	4000	500	0.54*	20	1440††
C	RF Amplifier Plate Modulated at 75 MHz	3200	0.27	3000	500	0.27	3.5	630
AB_1	RF Linear Amplifier at 75 MHz	4000	0.35	3000	750	0.29	—	470††
AB_1	AF Amplifier or Modulator	4000	0.35	4000	750	0.59*	—	1540*
AB_2	AF Amplifier or Modulator	4000	0.35	4000	500	0.64*	7.0	1750*

*Two tubes.
††Useful Output Power.
†At I_b = 100 mA.

4-400C/6775



The 4-400C/6775 is intended for use as an amplifier, oscillator, or modulator. The low grid-plate capacitance of this tetrode coupled with its low driving-power requirement allows considerable simplification of the associated circuit and driver stage.

The 4-400C/6775 is cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal. Cooling can be greatly simplified by using an EIMAC SK-410 Air-System Socket, and its accompanying glass chimney.

The 4-400C/6775 is especially recommended for applications where long life and consistent performance are of prime consideration.

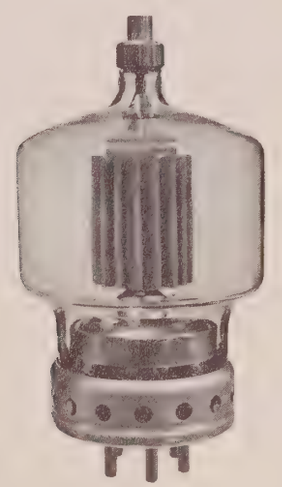
CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Screen Dissipation (Max.)	35 watts
Grid Dissipation (Max.)	10 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.7 amperes
Capacitances (Gnd. Cath. Connection):	
Input	12.5 pF
Output	4.7 pF
Feed-through	0.12 pF
Amplification Factor (g_1-g_2)	5.1
Transconductance†	4000 μmhos
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-406
Recommended Heat Dissipating Connector	HR-6
Maximum Plate Seal Temperature	225°C
Maximum Base Seal Temperature	200°C
Maximum Length:	6.38 in; 162.00 mm
Maximum Diameter:	3.56 in; 90.40 mm
Weight (approximate)	9.0 oz; 255 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier at 75 MHz	4000	0.35	4000	500	0.35	5.8	1100
C	RF Amplifier at 110 MHz	4000	0.35	4000	500	0.54*	20	1400††
C	RF Amplifier Plate Modulated at 75 MHz	3200	0.27	3000	500	0.27	3.5	630
AB_1	RF Linear Amplifier at 75 MHz	4000	0.35	3000	750	0.29	—	470††
AB_1	AF Amplifier or Modulator	4000	0.35	4000	750	0.59*	—	1540
AB_2	AF Amplifier or Modulator	4000	0.35	4000	500	0.64*	7.0	1750*

*Two tubes.
††Useful Output Power.
†At I_b = 100 mA.

4-500A



The 4-500A is intended for use as an amplifier, oscillator, or modulator. The low grid-plate capacitance of this tetrode coupled with its low driving-power requirement allows considerable simplification of the associated circuit and driver stage.

The 4-500A is cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal. Cooling can be greatly simplified by using an EIMAC SK-410 Air-System Socket, and its accompanying glass chimney.

The 4-500A is especially recommended for applications where long life and consistent performances are of prime consideration.

CHARACTERISTICS

Plate Dissipation (Max.)	500 watts
Screen Dissipation (Max.)	35 watts
Grid Dissipation (Max.)	12 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	10.2 amperes
Capacitances (Gnd. Cath. Connection):	
Input	15.0 pF
Output	5.0 pF
Feed-through	0.15 pF
Amplification Factor (g_1-g_2)	5.5
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-426
Recommended Heat Dissipating Connector	HR-6
Maximum Base Seal Temperature	200°C
Maximum Plate Seal Temperature	225°C
Maximum Length:	7.00 in; 177.80 mm
Maximum Diameter:	3.56 in; 90.40 mm
Weight (approximate)	8.7 oz; 245 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS Plate Voltage (volts)	MAXIMUM RATINGS Plate Current (amps)	TYPICAL OPERATION Plate Voltage (volts)	TYPICAL OPERATION Screen Voltage (volts)	TYPICAL OPERATION Plate Current (amps)	TYPICAL OPERATION Drive Power (watts)	TYPICAL OPERATION Output Power (watts)
C	RF Amplifier at 75 MHz	4000	0.45	3800	500	0.45	9.0	1265
C	RF Amplifier Plate Modulated at 30 MHz	3200	0.35	3200	500	0.34	5.8	830
AB_1	RF Linear Amplifier at 30 MHz	4000	0.45	4000	750	0.32	—	773
AB_1	AF Amplifier or Modulator	4000	0.45	3800	750	0.72*	—	1720*

*Two tubes.

4-1000A/8166

The 4-1000A/8166 is intended for use as an amplifier, oscillator, or modulator and is capable of efficient operation well into the VHF range.

In FM broadcast service on 110 MHz, two 4-1000A/8166 tetrodes will deliver a useful output power of over 5 kW.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced-air through the base and around the envelope. Cooling can be simplified through the use of an EIMAC SK-510 Air-System Socket and its accompanying glass chimney.

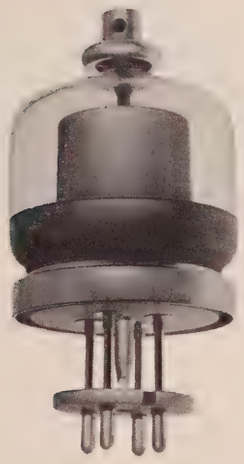
CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Screen Dissipation (Max.)	75 watts
Grid Dissipation (Max.)	25 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	21.3 amperes
Capacitances (Gnd. Cath. Connection):	
Input	28.1 pF
Output	8.1 pF
Feed-through	0.3 pF
Amplification Factor (g_1-g_2)	6.9
Transconductance	10,000 μmhos
Base	5-Pin Special
Recommended Air-System Socket	SK-510
Recommended Air Chimney	SK-506
Recommended Heat Dissipating Connector	HR-8
Maximum Seal Temperature	200°C
Maximum Envelope Temperature	225°C
Maximum Length:	9.63 in; 244.60 mm
Maximum Diameter:	5.25 in; 133.30 mm
Weight (approximate)	1.5 lb; 0.68 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	6000	0.70	6000	500	0.70	15	3400
C	RF Amplifier at 110 MHz	6000	0.70	6000	500	1.25*	400	5200*†
C	RF Amplifier Plate Modulated at 30 MHz	5000	0.60	5000	500	0.60	11	2440†
AB_1	AF Amplifier or Modulator	6000	0.70	6000	1000	0.95*	—	3840*
AB_2	AF Amplifier or Modulator	6000	0.70	6000	500	0.95*	9.4	3900*

*Two tubes.
†Useful Output Power.

4PR60C/8252W



The 4PR60C/8252W is intended for pulse-modulator service in circuits employing inductive or resistive loads. This tube unilaterally replaces the 715C, the 5D21 and the 4PR60B/8252. The internal structure of the tube has been strengthened to minimize the effects of shock and vibration.

The 4PR60C/8252W has a maximum plate dissipation rating of 60 watts, is cooled by radiation and convection, and delivers pulse output power in the region of 300 kW with less than one kW of pulse driving power.

CHARACTERISTICS

Plate Dissipation (Max.)	60 watts
Screen Dissipation (Max.)	8 watts
Grid Dissipation (Max.)	1 watt
Cooling	Radiation & Forced Air
Cathode	Oxide-coated Unipotential
Voltage	26.0 volts
Current	2.1 amperes
Capacitances (Gnd. Cath. Connection):	
Input	43.0 pF
Output	8.5 pF
Feed-through	1.5 pF
Base	4-Pin Special
Recommended Heat Dissipating Connector	HR-8
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	6.00 in; 152.40 mm
Maximum Diameter:	3.06 in; 77.90 mm
Weight (approximate)	12 oz; 0.34 kg.
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Switch Tube or Pulse Modulator	20,000	18.0*	20,000	1250	18.0*	—	337,000*

*During the pulse.

4PR65A/8187

The 4PR65A/8187 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact, high vacuum, radial-beam tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced-air through the base and around the envelope.

CHARACTERISTICS

Plate Dissipation (Max.)	65 watts
Screen Dissipation (Max.)	10 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	150 MHz
(Pulsed)	150 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	6 volts
Current	3.5 amperes
Capacitances (Gnd. Grid Connection):	
Input	7.2 pF
Output	2.25 pF
Feed-through	0.12 pF
Amplification Factor ($g_1 - g_2$)	.6
Base	5-Pin Special
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	4.37 in; 111 mm
Maximum Diameter:	2.38 in; 60.4 mm
Weight (approximate)	3 oz; 0.085 kg
Operating Position	Vertical base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	10,000	1.5	10,000	500	0.2	5.3‡	1,720
C	RF Amplifier Grid Pulsed	7,500	1.5	7,500	500	0.2	4.9	1,265
—	Switch Tube or Pulse Modulator	15,000	1.0	15,000	500	0.95	44.5	13,600

‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR125A/8247

The 4PR125A/8247 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact high vacuum, radial-beam tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced-air through the base and around the envelope. Cooling can be simplified by the use of the EIMAC SK-410 Air-System Socket and the SK-406 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.)	125 watts
Screen Dissipation (Max.)	20 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	120 MHz
(Pulsed)	120 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5 volts
Current	6.5 amperes
Capacitances (Gnd. Grid Connection):	
Input	10.8 pF
Output	3 pF
Feed-through	0.07 pF
Amplification Factor ($g_1 - g_2$)	5.9
Base	5-Pin Metal Shell
Recommended Air System Socket	SK-410
Recommended Air Chimney	SK-406
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	5.69 in; 1445 mm
Maximum Diameter:	2.81 in; 71.4 mm
Weight (approximate)	6.5 oz; 0.184 kg
Operating Position	Vertical Base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	12,000	2.5	12,000	1000	0.416	3.25‡	4,000
C	RF Amplifier Grid Pulsed	9,000	2.5	9,000	1000	0.416	3.2	2,880
—	Switch Tube or Pulse Modulator	18,000	1.5	18,000	1000	1.0	7.7	17,000

‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR250C/8248

The 4PR250C/8248 is intended for use in pulse-modulator, switch tube, pulsed-amplifier, and pulsed-oscillator service. This compact, high vacuum, radial-beam tetrode, incorporating a tantalum plate and non-emitting grids, is recommended for use where voltages to 50 kV are required.

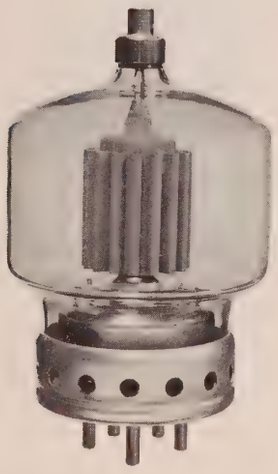
CHARACTERISTICS

Plate Dissipation (Max.) ..... 250 watts
Screen Dissipation (Max.) ..... 25 watts
Grid Dissipation (Max.) ..... 5 watts
Frequency for Max. Ratings (Pulsed) ..... 100 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 5.0 volts
  Current ..... 14.7 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 13.0 pF
  Output ..... 3.3 pF
  Feed-through ..... 0.12 pF
Amplification Factor (g_1-g_2) 5.1
Base ..... 5-Pin Special
Recommended Air-System Socket SK-410
Recommended Heat Dissipating Connector HR-8
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 7.63 in; 193.70 mm
Maximum Diameter: ..... 3.59 in; 91.30 mm
Weight (approximate) ..... 12.5 oz; 355 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	35,000	5.5*	35,000†	1500†	0.9†	4.5‡	26,500†
C	RF Amplifier Grid Pulsed	25,000	5.5*	25,000	1500	0.94†	4.7†	19,000†
—	Switch Tube or Pulse Modulator	50,000	4.0	50,000	1500	4.0†	25†	192,000†

*Cathode peak current.
†Pulse values.
‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR400A/8188



The 4PR400A/8188 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling can be simplified by the use of the E'MAC SK-410 Air System Socket and the SK-406 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 400 watts
Screen Dissipation (Max.) ..... 35 watts
Grid Dissipation (Max.) ..... 10 watts
Frequency for Max. Ratings (Pulsed) ..... 110 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 5.0 volts
  Current ..... 14.7 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 12.5 pF
  Output ..... 4.7 pF
  Feed-through ..... 0.12 pF
Amplification Factor (g_1-g_2) 5.1
Base ..... 5-Pin Special
Recommended Air-System Socket SK-410
Recommended Air Chimney SK-406
Recommended Heat Dissipating Connector HR-6
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 6.37 in; 161.90 mm
Maximum Diameter: ..... 3.56 in; 90.50 mm
Weight (approximate) ..... 9.0 oz; 255.0 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	15,000	5.4*	15,000†	1500†	0.87†	9.0‡	10,500†
C	RF Amplifier Grid Pulsed	10,000	5.4*	10,000	1500	0.87†	8.5†	6,600†
—	Switch Tube or Pulse Modulator	20,000	4.0	20,000	1500	3.5†	35†	64,000†

*Cathode peak current.
†Pulse Value.
‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR1000A/8189

The 4PR1000A/8189 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact, tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling is simplified by the use of the EIMAC SK-510 Air-System Socket and the SK-506 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Screen Dissipation (Max.) ..... 75 watts
Grid Dissipation (Max.) ..... 25 watts
Frequency for Max. Ratings (Pulsed) ..... 110 MHz
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.5 volts
  Current ..... 21.3 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 28.1 pF
  Output ..... 8.1 pF
  Feed-through ..... 0.25 pF
Base ..... 5-Pin Special
Recommended Air-System Socket SK-510
Recommended Air Chimney SK-506
Recommended Heat Dissipating Connector HR-8
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 9.62 in; 244.50 mm
Maximum Diameter: ..... 5.25 in; 133.30 mm
Weight (approximate) ..... 1.5 lb; 0.68 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	20,000	8	20,000†	1500†	1.95†	15.7‡	31,500†
C	RF Amplifier Grid Pulsed	15,000	8	15,000	1500	1.95†	15.2†	23,000†
—	Switch Tube or Pulse Modulator	30,000	8†	30,000	1500	8.0†	116†	220,000†

†Pulse Value.
‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

8960

The 8960 is designed for high power pulse modulator or switch tube service, operating at voltages up to 50 kVdc or anode current as high as 12 amperes.

Cooling is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling is simplified by use of the EIMAC SK-510 Air-System Socket and the SK-506 Air Chimney.

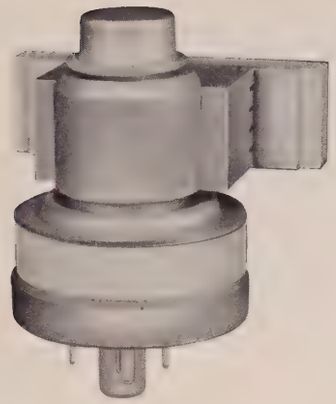
CHARACTERISTICS

Plate Dissipation (Max.) ..... 1200 watts
Screen Dissipation (Max.) ..... 75 watts
Grid Dissipation (Max.) ..... 25 watts
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 7.0 volts
  Current ..... 36 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 28.0 pF
  Output ..... 6.3 pF
  Feed-through ..... 0.30 pF
Amplification Factor (g_1-g_2) 7
Base ..... 5-Pin special
Recommended Air-System Socket SK-510
Recommended Air Chimney SK-506
Recommended Heat Dissipating Connector HR-8
Maximum Seal & Envelope Temperature ..... 200°C
Maximum Length: ..... 9.62 in; 24.48 mm
Maximum Diameter: ..... 5.25 in; 13.33 mm
Weight (approximate) ..... 1.5 lb; 0.68 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Pulse Modulator or Switch Tube	50,000	12 •	45,000	1500	10 •	75	425,000

• Peak value.

4CS250R



The 4CS250R is electrically identical to the 4CX250R except that the maximum dissipation of the 4CS250R is limited only by the maximum allowable anode and ceramic/metal seal temperatures. A beryllium oxide (BeO) thermal link is brazed to the anode providing an electrically isolated, low thermal resistance path between the anode and the heat sink. Ruggedized construction allows the 4CS250R to be operated in applications where shock and/or vibration is experienced.

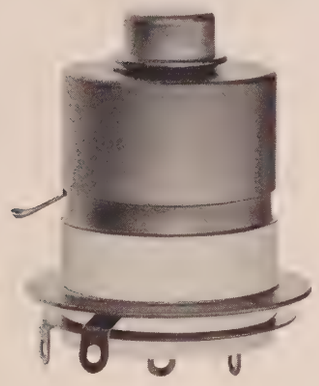
CHARACTERISTICS

Plate Dissipation (Max.) .. Dependent on Cooling Technique
Screen Dissipation (Max.) ..... 12 watts
Grid Dissipation (Max.) ..... 2 watts
Frequency for Max. Ratings (CW) ..... 500 MHz
Cooling ..... Conduction
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 2.6 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 17.0 pF
  Output ..... 4.7 pF
  Feed-through ..... 0.04 pF
Base ..... 9-Pin Special
Recommended Socket SK-660, SK-661
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.46 in; 62.60 mm
Maximum Diameter: ..... 1.76 in; 44.90 mm
Weight (approximate) ..... 5 oz; 141.7 gm
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 175 MHz	2000	0.25	2000	250	0.24	1.1	379
C	RF Amplifier Plate Modulated	1500	0.20	1500	250	0.20	1.7	235
AB_1	RF Linear Amplifier	2000	0.25	2000	400	0.24	—	470†
AB_1	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.
†Useful PEP Output Power.

8954



The 8954 is designed for switch-tube (or modulator) and voltage regulator service, with plate current up to 8 amperes with short pulses (to 2 microseconds) and derated values of plate current at longer pulse lengths.

The tube has an oxide cathode and all electrical connections are made to solder tabs which are integral to the tube elements.

The 8954 is supplied bare-anode and is intended to be cooled by heat sink, or liquid immersion, or a combination, and is nominally rated for 600 watts of anode dissipation.

CHARACTERISTICS

Plate Dissipation (Max.)* ..... 600 watts
Screen Dissipation (Max.) ..... 15 watts
Grid Dissipation (Max.) ..... 4 watts
Cooling ..... Conduction or Liquid Immersion
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 5.6 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 50.0 pF
  Output ..... 6.2 pF
  Feed-through ..... 0.14 pF
Base ..... Special, Solder-tab Terminal
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 2.52 in; 64.01 mm
Maximum Diameter: ..... 1.77 in; 44.96 mm
Weight (approximate) ..... 6.0 oz; 170 gm
Operating Position ..... Any

*Dissipation capability is dependent on cooling technique.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Switch Tube or Pulse Modulator (Air Operation)	5500	8.0	5000	800	8	0	36,000
—	Switch Tube or Pulse Modulator	7500	8.0	7000	800	8	0	52,000

5CX1500A

The 5CX1500A is designed for use as a Class AB_1 linear amplifier in audio or radio frequency applications. Its characteristic low intermodulation distortion makes it especially suitable for single sideband service.

The tube is also recommended for use as a Class C RF power amplifier in CW, FM and AM service.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 1500 watts
Suppressor Dissipation (Max.) ..... 25 watts
Screen Dissipation (Max.) ..... 75 watts
Grid Dissipation (Max.) ..... 25 watts
Frequency for Max. Ratings (CW) ..... 110 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten mesh
  Voltage ..... 5.0 volts
  Current ..... 40 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 75.0 pF
  Output ..... 16.5 pF
  Feed-through ..... 0.2 pF
Capacitances (Gnd. Grid Connection):
  Input ..... 34.5 pF
  Output ..... 16.5 pF
  Feed-through ..... 0.05 pF
Amplification Factor (g_1 -g_2) 5.5
Transconductance‡ ..... 24,000 μmhos
Base ..... Special Ring and Breechblock
Recommended Air-System Socket SK-840
Recommended Air Chimney SK-806
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 4.95 in; 125.70 mm
Maximum Diameter: ..... 3.37 in; 85.60 mm
Weight (approximate) ..... 30 oz; 850 gm
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	5000	1.0	4500	500	0.90	9.0	3180
C	RF Amplifier Plate Modulated	3500	0.8	3200	500	0.80	10.0	1958
AB_1	RF Linear Amplifier	4000	1.0	4000	500	0.70	—	1785
AB_1	AF Amplifier or Modulator	4000	1.0	3800	500	1.3*	—	3220*

*Two tubes.
‡At I_b = 1.0 A

5CX3000A

The 5CX3000A is designed for use as a Class AB_1 linear amplifier in audio or radio-frequency applications. Its characteristics of low intermodulation distortion make it especially suitable for single sideband service.

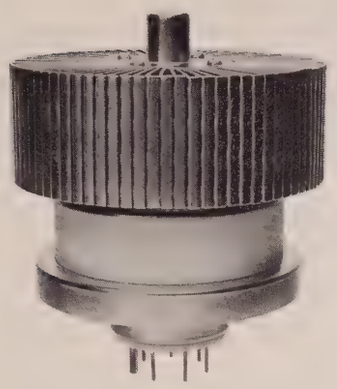
CHARACTERISTICS

Plate Dissipation (Max.) ..... 4000 watts
Suppressor Dissipation (Max.) ..... 100 watts
Screen Dissipation (Max.) ..... 175 watts
Grid Dissipation (Max.) ..... 50 watts
Frequency for Max. Ratings (CW) ..... 150 MHz
Cooling ..... Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 9.0 volts
  Current ..... 41.5 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 135 pF
  Output ..... 21.0 pF
  Feed-through ..... 0.4 pF
Capcitances (Gnd. Grid Connection):
  Input ..... 61.0 pF
  Output ..... 21.0 pF
Amplification Factor (g_1-g_2) 5.5
Base ..... Special Ring and Breechblock
Recommended Air-System Socket SK-1420
Recommended Air Chimney SK-1426
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 6.84 in; 173.70 mm
Maximum Diameter: ..... 4.63 in; 117.60 mm
Weight (approximate) ..... 5.5 lb; 2.5 kg
Operating Position ..... Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	7000	2.0	6800	500	1.6	52	8,500
AB_1	RF Linear Amplifier	7000	2.0	6000	850	1.4	—	5,500
AB_1	AF Amplifier or Modulator	7000	2.0	6000	850	2.9*	—	11,000*

*Two tubes.

8295A



The 8295A is a forced-air cooled, radial beam pentode capable of high power gain and excellent efficiency at relatively low plate voltage. The 8295A is a direct replacement for the 8295.

This external-anode tube is especially suited for Class AB_1 linear RF amplifier service, but will also provide excellent performance in Class AB_2, Class B and Class C service.

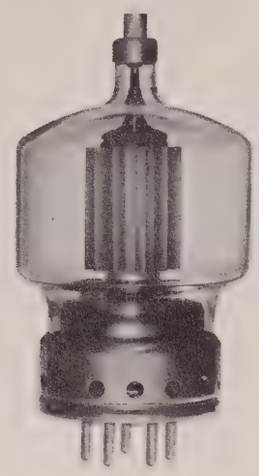
CHARACTERISTICS

Plate Dissipation (Max.) ..... 1000 watts
Screen Dissipation (Max.) ..... 30 watts
Grid Dissipation (Max.) ..... 5 watts
Frequency for Max. Ratings ..... 30 MHz
Cooling ..... Forced Air
Cathode ..... Oxide-coated Unipotential
  Voltage ..... 6.0 volts
  Current ..... 8.2 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 40 pF
  Output ..... 18.5 pF
  Feed-through ..... .09 pF
Base ..... 7-Pin Special
Recommended Air System Socket SK-184
Maximum Seal & Anode Core Temperature ..... 250°C
Maximum Length: ..... 5.05 in; 128 mm
Maximum Diameter: ..... 4.03 in; 102 mm
Weight (approximate) ..... 2.8 lb; 1.27 kg
Operating Position ..... Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	1.0	3000	500*	0.82	2.1	1770†
AB_1	RF Linear Amplifier	3000	0.8	3000	500*	0.80	—	1700†

*Suppressor grid voltage = +35 Vdc.
†Useful Power Output.

5-500A



The 5-500A is intended for use as an amplifier, oscillator or modulator. The high plate current rating, low grid-plate capacitance and low driving power requirements permit maximum power capability to be combined with circuit simplicity and economic driver requirements.

The suppressor element of the 5-500A terminates at the tube base shell, and is designed to be operated at ground (zero) potential. The base shell must be grounded by means of suitable spring clips.

CHARACTERISTICS

Plate Dissipation (Max.) ..... 500 watts
Screen Dissipation (Max.) ..... 35 watts
Suppressor Dissipation ..... 10 watts
Grid Dissipation (Max.) ..... 12 watts
Cooling ..... Radiation & Forced Air
Filament ..... Thoriated Tungsten
  Voltage ..... 10.0 volts
  Current ..... 10.2 amperes
Capacitances (Gnd. Cath. Connection):
  Input ..... 17.0 pF
  Output ..... 10.8 pF
  Feed-through ..... 0.1 pF
Base ..... 5-Pin Special
Recommended Air System Socket SK-410
Recommended Air Chimney SK-426
Recommended Heat Dissipating Connector HR-6
Maximum Plate Seal Temperature ..... 225°C
Maximum Base Seal Temperatures ..... 200°C
Maximum Length: ..... 7.00 in; 177.80 mm
Maximum Diameter: ..... 3.56 in; 90.40 mm
Weight (approximate) ..... 11 oz; 312 gm
Operating Position ..... Vertical, base up or down

		MAXIMUM RATINGS		TYPICAL OPERATION				
Class of Operation	Type of Service	Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	4000	0.45	4000	500	0.45	14	1300
C	RF Amplifier Plate Modulated	3200	0.35	3100	470	0.26	6	580
AB_1	RF Linear Amplifier	4000	0.45	4000	750	0.32	—	832
AB_1	AF Amplifier or Modulator	4000	0.45	4000	750	0.65*	—	1664*

*Two tubes.

EIMAC offers a broad line of cavity amplifier and oscillators for use in broadcast communications, TACAN, ECM, and scientific applications. All cavities employ state-of-the-art design technique for optimum performance and reliability.

Each cavity is optimized around an EIMAC high performance power grid tube. A tube selected for use in an EIMAC cavity represents the latest advances in power grid technology.

Circuit designs are simple and straightforward. Standard rf components are used throughout where possible. In cases where high performance can only be achieved with special components, EIMAC part numbers are available for ordering directly from the EIMAC division of Varian.

EIMAC cavities are available as a sub-system. This results in substantial savings in development cost and time. To avoid premature system obsolescence, an EIMAC tube and cavity combination should be selected for your particular requirement.

CV-2200/CV-2210

The CV-2200/CV-2210 are power-amplifier cavity assemblies designed for use in the commercial FM broadcast band between 86 and 108 MHz.

Cavity design is straightforward and relatively simple. The amplifier tube used is the EIMAC 8989 or 8990, both of which are high-performance tetrodes designed especially for VHF applications. In these cavity assemblies the tube in use is grid-driven for a stage gain of approximately 18.5 dB with a useful power output of 15 kW with the 8989, or approximately 18 dB gain with a useful power output of 27.5 kW with the 8990.

CHARACTERISTICS

Tuning Range	86-108 MHz
Tube Type Used (not supplied)	8989 or 8990
Input rf connector	Type N
Output rf connector	3⅛ in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-inch Rack
Overall Dimensions (nominal):	
Height	36 in; 91.4 cm
Width	19 in; 48.3 cm
Depth	21 in; 27.3 cm
Net Weight, approx. (tube not installed)	60 lbs; 27.3 kg

TYPICAL OPERATION (95.7 MHz)

	CV-2200 with 8990		CV-2210 with 8989		
Heater Voltage	10.0	10.0	7.5	7.5	Vac
Heater Current (Approx.)	140	140	120	120	Aac
Anode Voltage	10.0	10.0	8.0	8.0	kVdc
Grid Bias Voltage	−300	−400	−300	−400	Vdc
Screen Grid Voltage	750	800	750	800	Vdc
Anode Current	3.25	3.35	1.6	2.58	Adc
Grid Current[1]	26	26	51	38	mAdc
Screen Current[1]	220	205	115	120	mAdc
Driving Power[1]	305	430	165	250	W
Useful Output Power[1,2]	21	27.5	11	15.8	kW
Power Gain[1]	18.4	18.1	18.4	18.0	dB
Efficiency	81	83	84	77	%
Bandwidth (−3 dB points)	3	3	3	3	MHz

[1]Approximate value
[2]Power delivered to the load

CV-2240

(panel removed)

The EIMAC CV-2240 cavity is developed for use in low band VHF-TV broadcast service. Operating frequency range is CH-2 through CH-6. Power levels of up to 10 kW, peak-of-sync, can be obtained with good linearity.

The amplifier tube is the EIMAC 3CX10,000U7, a high-mu triode designed with beam-forming cathode and control grid geometry. It is cathode driven for a stage gain of approximately 14 dB. The triode design eliminates many of the problems associated with tetrode designs and has comparable gain.

CHARACTERISTICS

Tuning Range, CH-2 through CH-6 ..... 54-88 MHz
Tube Type Used (not supplied) 3CX10,000U7
input rf connector ..... Type N
Output rf connector ..... 1⅝-inch EIA Coaxial
Cooling Required ..... Forced Air
Mounting ..... Vertical: Designed to fit 19-inch Rack
Overall Dimensions (nominal):
- Height ..... 32 in; 81.3 cm
- Width ..... 19 in; 48.3 cm
- Depth ..... 19 in; 48.3 cm

Net Weight, approx. (tube not installed) ..... 55 lbs; 25 kg

TYPICAL OPERATION (79 MHz) CH-5

	5kW	10 kW	
Heater Voltage	15	15	Vac
Heater Current (Approx.)	13.0	13.0	Aac
Anode Voltage	4.0	5.5	kVdc
Grid Bias Voltage	−23	−29	Vdc
Anode Current	2.74	3.68	Adc
Grid Current[1]	70	50	mAdc
Driving Power[1]	280	400	W
Useful Output Power[1,2]	5.6	10.2	kW
Power Gain[1]	13	14	dB
Efficiency	51	50	%
Bandwidth (−0.72 dB points)	6.31	6.31	MHz

[1]Approximate value
[2]Power delivered to the load, peak-of-sync.

CV-2250

The EIMAC CV-2250 is developed for use in high band VHF-TV broadcast service. Operating frequency range is CH-7 through CH-13 Domestic, and CH-7 through CH-E2 European. Power levels of up to 10 kW, peak-of-sync, can be obtained with good linearity.

Cavity design is straightforward and relatively simple. Input and output matching is accomplished through a combination of TEM mode cavity resonators and lumped elements.

The amplifier tube is the EIMAC 3CX10,000U7, a high-mu triode designed with beam-forming cathode and control grid geometry. It is cathode driven for a stage gain of approximately 14 dB. The triode design eliminates many of the problems associated with tetrode designs and has comparable gain.

CHARACTERISTICS

Tuning Range (170-227 MHz) ..... CH-7-CH-13 Domestic, CH-7-CH-E2 European
Tube Type Used (not supplied) 3CX10,000U7
Input rf connector ..... Type N
Output rf connector ..... 1⅝-inch EIA coaxial
Cooling Required ..... Forced Air
Mounting Position .... Vertical: Designed to fit 19-inch Rack
Overall Dimensions (nominal):
- Height (Min.) ..... 41.75 in; 106.05 cm
- (Max.) ..... 50.0 in; 127 cm
- Width ..... 15.5 in; 39.37 cm
- Depth ..... 12.25 in; 31.12 cm

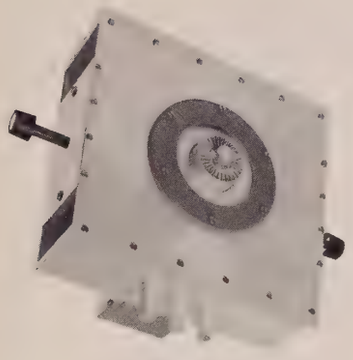
Net Weight, approx. (tube not installed) ..... 80 lbs; 36.3 kg

TYPICAL OPERATION (177 MHz)

	5 kW	10 kW	
Heater Voltage	15.0	15.0	Vac
Heater Current (Approx.)	13.0	13.0	Aac
Anode Voltage	4.0	5.5	kVdc
Grid Bias Voltage	−22.0	−31	Vdc
Anode Current	2.5	3.5	Adc
Grid Current[1]	83	87	mAdc
Driving Power[1]	200	335	W
Useful Output Power[1, 2]	5.0	10.55	kW
Power Gain[1]	14	15	dB
Efficiency	50	55	%
Bandwidth (−0.72 dB points)	6.28	6.28	MHz

[1]Approximate value
[2]Power delivered to the load, peak-of-sync.

CV-2400/CV-2400P



The CV-2400/CV-2400P cavities are designed specifically for CW or FM applications in the 420–450 MHz range. The CV-2400 is capable of output power to 300 watts. The CV-2400P is available for pulsed applications to 1250 watts.

The amplifier tube is the EIMAC 8874, a high-mu triode designed with beam-forming cathode and control grid geometry. The tube is cathode driven for a stage gain of approximately 13 dB. The triode design eliminates many of the cavity and equipment design problems encountered with tetrode cavities.

Contact the EIMAC San Carlos facility for information and delivery on the CV-2400P.

CHARACTERISTICS

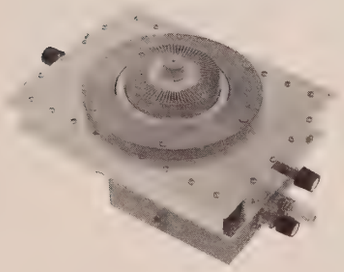
Tuning Range	420-450 MHz
Tube Type Used (not supplied)	8874
Input rf connector	Type N
Output rf connector	Type N
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Height	5.0 in; 12.7 cm
Width	8.5 in; 21.6 cm
Depth	8.25 in; 20.9 cm
Net Weight, approx. (tube not installed)	13 lbs; 6.0 kg

TYPICAL OPERATION (450 MHz)

	CV-2400 CW or FM	CV-2400P Pulsed	
Heater Voltage	5.0	6.3	Vac
Heater Current (Approx.)	2.8	3.0	Aac
Anode Voltage	1.5	2.5	kVdc
Grid Bias Voltage	−2.0	−15	Vdc
Anode Current	0.4	1.25	Adc
Grid Current[1]	−7.0 mA	10	mAdc
Driving Power[1]	15	125	W
Useful Output Power[1,2]	300	1250	W
Power Gain[1]	13	10	dB
Efficiency	50	40	%
Bandwidth (3 dB points)	4	4	MHz

[1]Approximate value
[2]Power delivered to the load

CV-2410/CV-2410P



The EIMAC CV-2410 cavity is designed for communications service in the 420–450 MHz band and is capable of output power to 1500 watts. A special version, CV-2410P, is available for pulsed applications to 13 kW.

The amplifier tube is the EIMAC 8938, a high-mu power triode. The 8938 has excellent linearity and power gain due to the beam forming geometry of special grid and cathode design.

Contact the EIMAC San Carlos facility for information and delivery on the CV-2410P.

CHARACTERISTICS

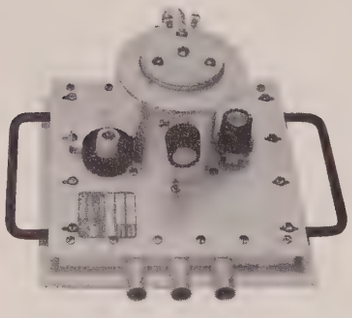
Tuning Range	420-450 MHz
Tube Type Used (not supplied)	8938
Input RF connector	Type N
Output RF connector	Type LC
Cooling Required	Forced Air
Mounting Positon	Any
Overall Dimensions (nominal):	
Height	5.0 in; 12.7 cm
Width	8.0 in; 20.3 cm
Depth	10.0 in; 25.4 cm
Net Weight, approx. (tube not installed)	14 lbs; 6.4 kg

TYPICAL OPERATION (450 MHz)

	CV-2410 CW or FM	CV-2410P Pulsed	
Heater Voltage	4.5	5.5	Vac
Heater Current (Approx.)	10.0	11.0	Aac
Anode Voltage	2.0	4.8	kVdc
Grid Bias Voltage	−12	−50	Vdc
Anode Current	1.18	4.15	Adc
Grid Current[1]	6.0	300	mAdc
Driving Power[1]	100	700	W
Useful output Power[1,2]	1.5	13.4	kW
Power Gain[1]	12	12.8	dB
Efficiency	62	67	%

[1]Approximate value
[2]Power delivered to the load

CV-2800



The CV-2800 is a power-amplifier cavity assembly designed for use in the 850–870 MHz portion of the UHF band assigned for land-mobile service, as the base station final amplifier.

Cavity design is straightforward and relatively simple. The amplifier tube used is the EIMAC 3CX400U7/8961, a high-mu triode designed with beam-forming cathode and control grid geometry. It is cathode driven for a stage gain of approximagely 13.5 dB. The triode design eliminates many of the cavity and equipment complications associated with tetrode cavities but has comparable stage gain.

The CV-2800 employs standard 50-ohm coaxial RF connectors and silver-plated components for best performance and efficiency.

CHARACTERISTICS

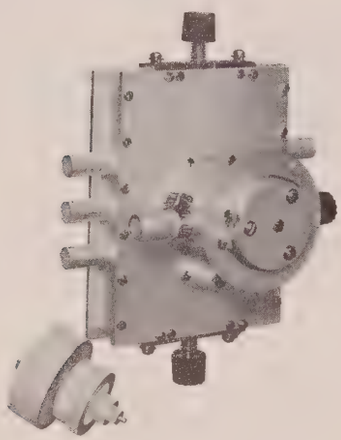
Tuning Range	850-870 MHz
Tube Type Used (not supplied)	3CX400U7/8961
Input & Output Connector	Type N
Cooling Required	Forced Air
Mounting	Optional: normally mounts to 19-inch Back Panel
Overall Dimensions (nominal):	
Height (outside of handles)	8.99 in; 22.80 cm
Width (outside of air-inlet tubes)	7.62 in; 19.35 cm
Depth (tube not installed)	4.64 in; 11.78 cm
Net Weight, approx. (tube not installed)	7.5 lbs; 3.4 kg

TYPICAL OPERATION

Heater Voltage (warmup or standby)	6.3 Vac
Heater Voltage (during operation)	5.0 Vac
Heater Current (at 6.3 volts)	3.0 Aac
Anode Voltage	1500 Vdc
Grid Bias Voltage	−2.0 Vdc
Anode Current	400 mAdc
Grid Current[1]	−5.0 mAdc
Driving Power[1]	10 W
Useful Output Power[1,2]	225 W
Power Gain[1]	13.5 dB
Bandwidth (−3 dB points)	6.5 MHz
Modulation	FM

[1]Approximate value
[2]Power delivered to the load

CV-2810



The CV-2810 is a power-amplifier cavity assembly designed for use in the 915-970 MHz portion of the UHF band.

Cavity design is straightforward and relatively simple. The amplifier tube used is the EIMAC 3CX400U7/8961, a high-mu triode designed with beam-forming cathode and control grid geometry. It is a cathode driven for a stage gain of approximately 12 dB. The triode design eliminates many of the cavity and equipment design complications associated with tetrode cavities but has comparable stage gain.

The CV-2810 employs standard 50-ohm coaxial RF connectors and silver-plated components for best performance and efficiency.

CHARACTERISTICS

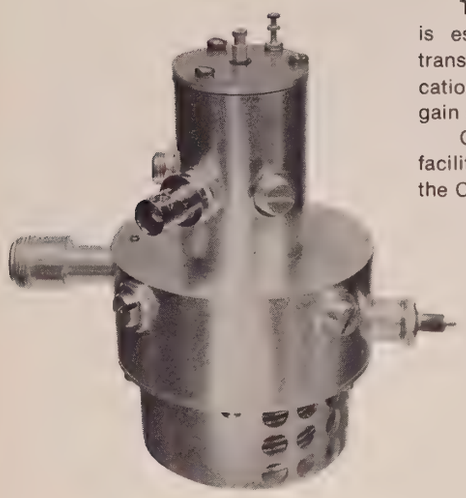
Tuning Range	915-970 MHz
Tube Type used (not supplied)	3CX400U7/8961
Input & Output Connector	Type N
Cooling Required	Forced Air
Mounting	Optional: normally mounts to 19-inch Panel
Overall Dimensions (nominal):	
Height (outside tuning & loading controls)	6.25 in; 15.9 cm
Width (outside air inlet tubes)	5.00 in; 12.7 cm
Depth (tube not installed)	3.91 in; 9.9 cm
Net Weight, approx. (tube not installed)	5.2 lbs; 2.4 kg

TYPICAL OPERATION (932 MHz)

Heater Voltage (warmup or standby)	6.3 Vac
Heater Voltage (during operation)	4.5 Vac
Heater Current (at 6.3 volts)	3.0 Aac
Anode Voltage	1500 Vdc
Grid Bias Voltage	−2.0 Vdc
Anode Current	400 mAdc
Grid Current (approx.)	−5.0 mAdc
Driving Power (approx.)	12.3 W
Useful Output Power (approx.)	190 W
Power Gain (approx.)	12.1 dB
Bandwidth (−3 dB points)	6.5 MHz
Modulation	FM

[1]Approximate value
[2]Power delivered to the load

CV-8008



The EIMAC CV-8008 coaxial cavity is especially designed for television translator service in the 2150 MHz educational band. It features high power gain and good efficiency.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8008 and Y-732.

CHARACTERISTICS

Tuning Range	2140-2160 MHz
Tube Type Used (not supplied)	Y-732
Input RF Connector	Type BNC Female
Output RF Connector	Type N Female
Amplifier	TV Translator
Class of Operation	Class AB
Peak Sync Power	Up to 100 W
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	5.9 in; 15 cm
Diameter	2.9 in; 7.4 cm
Net Weight, approx. (tube not installed)	2 lbs; 0.9 kg

TYPICAL OPERATION (2150 MHz)

Heater Voltage	6.0 Vac
Heater Current (approx.)	1.3 Aac
Anode Voltage	1.5 kVdc
Grid Bias Voltage*	−8 Vdc
Anode Current	160 mAdc
Useful Output Power[1,2**]	60W
Power Gain[1]	15 dB
Efficiency	25%
Bandwidth (3 dB points)	25 MHz

[1]Approximate value
[2]Power delivered to the load
*Cathode resistor
**Peak sync

CV-8020

The EIMAC CV-8020 coaxial cavity amplifier is specially designed for high efficiency, linearity, and highly reliable ground TACAN operation. In grounded-grid operation with cathode drive, the EIMAC CV-8020 can deliver up to 8 kW peak power.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8020 and the Y-739F.

CHARACTERISTICS

Tuning Range	960-1215 MHz
Tube Type Used (supplied)	Y-739F
Input RF Connector	Type SMA Female
Output RF Connector	Type N Female
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	17.50 in; 44.45 cm
Diameter	3.94 in; 10.01 cm
Net Weight, approx. (tube not installed)	6.6 lbs; 3.0 kg

TYPICAL OPERATION (960-1215 MHz)

Heater Voltage	6.3 Vac
Heater Current (approx.)	2.25 Aac
Anode Voltage	5.0 kVdc
Grid Bias Voltage	−100 Vdc
Anode Current, peak	3 Adc
Driving Power[1]	225 W
Useful Output Power, peak[1,2]	4.5 kW
Power Gain[1]	13 dB
Efficiency	30%
Bandwidth (3 dB points)	20 MHz

[1]Approximate value
[2]Power delivered to the load

CV-8015

The EIMAC CV-8015 coaxial cavity oscillator is specially designed for high power, high efficiency and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC CV-8015 can deliver up to 20 kW peak power, depending on the pulse width and duty desired.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8015 and Y-739A.

CHARACTERISTICS

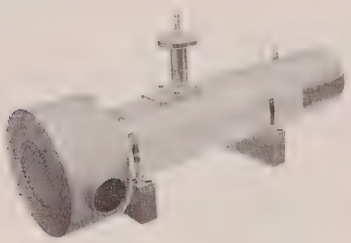
Tuning Range	950-2000 MHz
Tube Type Used (supplied)	Y-739A
Output RF Connector	Type HN Female
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	14.06 in; 35.71 cm
Diameter	3.25 in; 8.26 cm
Net Weight, approx. (tube not installed)	4.63 lbs; 2.1 kg

TYPICAL OPERATION (1000 MHz) *

Heater Voltage	6.3 Vac
Heater Current (approx.)	2.25 Aac
Anode Voltage	6.0 kVdc
Grid Bias Voltage	−150 Vdc
Anode Current (peak)	8Adc
Useful Output Power (peak)[1,2]	17 kW
Efficiency	35%

[1]Approximate value
[2]Power delivered to the load
*Single knob tuning over 25% range centered on any frequency between 950 and 2000 MHz.

CV-8018



The EIMAC CV-8018 coaxial cavity oscillator is specially designed for high power, high efficiency and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC CV-8018 can deliver up to 50 kW peak power, depending on the pulse width and duty desired.

Contact the EIMAC Salt Lake City fecility for information and delivery on the CV-8018 and the Y-793.

CHARACTERISTICS

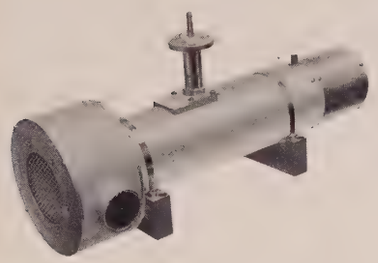
Tuning Range	650-800 MHz
Tube Type Used (supplied)	Y-793
Output RF Connector	EIA 7/8
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	21 in; 53.34 cm
Diameter	5 in; 12.7 cm
Net Weight, approx. (tube not installed)	22 lbs; 10 kg

TYPICAL OPERATION (725 MHz)

Heater Voltage	5.5 Vac
Heater Current (approx.)	12 Aac
Anode Voltage	5.5 kVdc
Grid Bias Voltage	−150 Vdc
Anode Current, peak	24 Adc
Useful Output Power, peak[1,2]	50 kW
Efficiency	38%

[1]Approximate value
[2]Power delivered to the load

CV-8022



The EIMAC CV-8022 coaxial cavity oscillator is specially designed for high power, high efficiency, and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC CV-8022 can deliver up to 50 kW peak power, depending on the pulse width and duty desired.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8022 and the Y-793.

CHARACTERISTICS

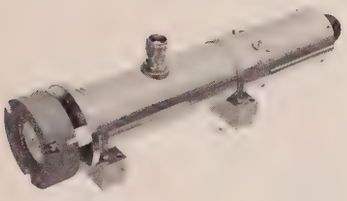
Tuning Range	800-980 MHz
Tube Type Used (supplied)	Y-793
Output RF Connector	EIA 7/8
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	17.9 in; 45.47 cm
Diameter	5 in; 12.7 cm
Net Weight, approx. (tube not installed)	20 lbs; 9.1 kg

TYPICAL OPERATION (900 MHz)

Heater Voltage	5.5 Vac
Heater Current (approx.)	12 Aac
Anode Voltage	5.6 kVdc
Grid Bias Voltage	−150 Vdc
Anode Current, peak	28 Adc
Useful Output Power, peak[1,2]	50 kW
Efficiency	32%

[1]Approximate value
[2]Power delivered to the load

CV-8024



The EIMAC CV-8024 coaxial cavity oscillator is specially designed for high power, high efficiency and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC CV-8024 can deliver up to 20 kW peak power, depending on the pulse width and duty desired.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8024 and the Y-739A.

CHARACTERISTICS

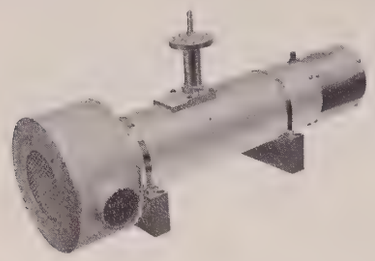
Tuning Range	1020-1280 MHz
Tube Type Used (supplied)	Y-739A
Output RF Connector	HN Female
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	8.44 in; 21.43 cm
Diameter	3 in; 7.62 cm
Net Weight, approx. (tube not installed)	4.63 lbs; 2.1 kg

TYPICAL OPERATION (1200 MHz)

Heater Voltage	6.3 Vac
Heater Current, approx.	2.25 Aac
Anode Voltage	6 kVdc
Grid Bias Voltage	−150 Vdc
Anode Current, peak	8 Adc
Useful Output Power[1,2]	17 kW
Efficiency	35.4%

[1]Approximate value
[2]Power delivered to the load

CV-8028



The EIMAC CV-8028 coaxial cavity oscillator is specially designed for high power, high efficiency and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC CV-8028 can deliver up to 50 kW peak power, depending on the pulse width and duty desired.

Contact the EIMAC Salt Lake City facility for information and delivery on the CV-8028 and the Y-793.

CHARACTERISTICS

Tuning Range	700-850 MHz
Tube Type Used (supplied)	Y-793
Output RF Connector	EIA 7/8
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	20.4 in; 51.82 cm
Diameter	6.5 in; 16.51 cm
New Weight, approx. (tube not installed)	22 lbs; 10 kg

TYPICAL OPERATION (800 MHz)

Heater Voltage	5.5 Vac
Heater Current, approx.	12 Aac
Anode Voltage	5.5 kVdc
Grid Bias Voltage	−150 Vdc
Anode Current, peak	28 Adc
Useful Output Power[1,2]	50 kW
Efficiency	32%

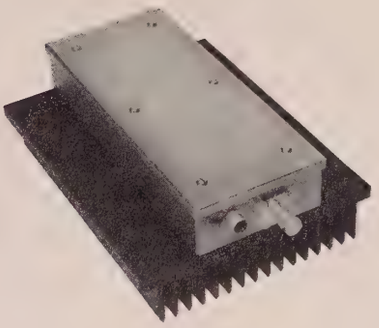
[1]Approximate value
[2]Power delivered to the load

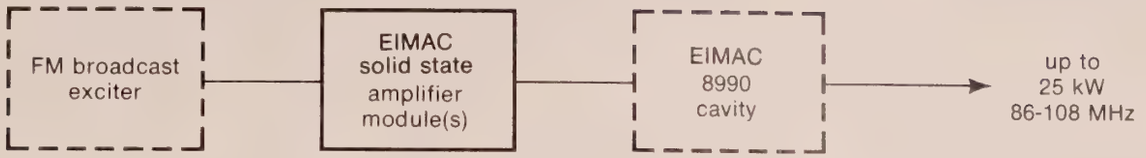
AM-2205, AM-2215A

EIMAC SOLID STATE AMPLIFIER MODULES.

EIMAC has developed a line of intermediate power amplifiers to drive tubes and cavities in the FM Broadcast Service. The broadband design permits operation over the entire FM band (86 to 108 MHz) without tuning. All modules are solid state to minimize service and extend reliability.

The solid state modules are offered as basic building blocks. The AM-2205A is the low level driver and the AM-2215A is the high level module. The AM-2215A module can be combined to give up to 550 W of available drive power using a typical 10 W FM exciter. A typical application for the amplifier module would be in a 25 kW FM broadcast transmitter.





GENERAL CHARACTERISTICS (TYPICAL DATA)

Module	Power Output	Drive Power	Power Gain	Supply Voltage	Supply Current	Efficiency
AM-2205	40 W	10 W	6 dB	28 Vdc	3.3 Adc	43
AM-2215A	150 W	15 W	10 dB	28 Vdc	10 Adc	53

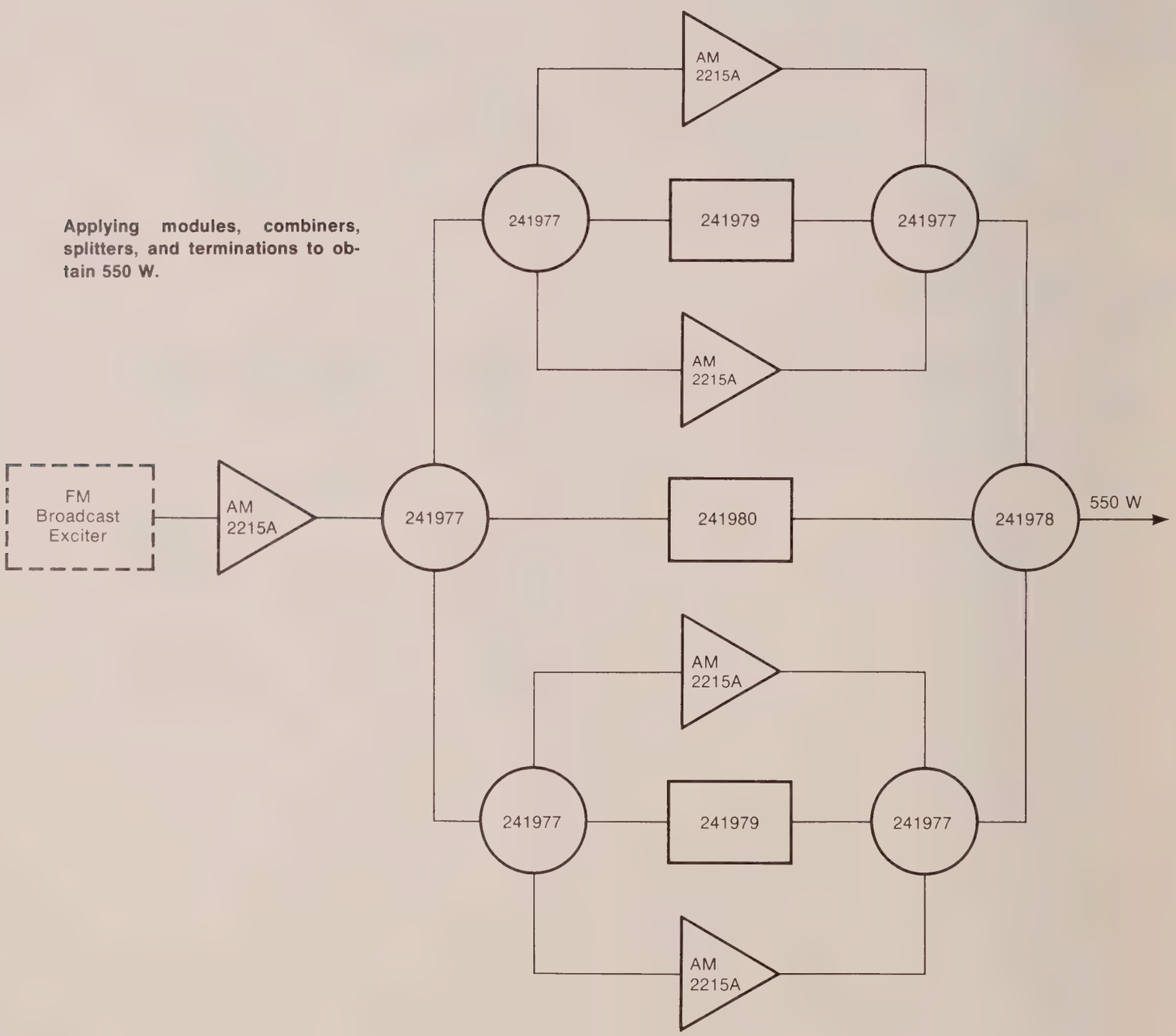
CHARACTERISTICS

Frequency Coverage ..... 86-108 MHz
RF Power Transitor ..... CTC BM 100-28 or equivalent
Input RF connector ..... N, BNC, or SMA
Output RF Connector ..... N, BNC, or SMA
Cooling required ..... Conduction Cooling with Forced Air
Mounting ..... Any
Overall Dimensions (nominal):
  Height ..... 2.625 in; 66.7 mm
  Width ..... 5.562 in; 141.2 mm
  Depth ..... 7.125 in; 181 mm
Net weight (approx.) ..... 3.3 lbs; 1.5 kg

PARTS REQUIRED TO COMBINE MODULES

EIMAC Part No.	Description
241976	50 W Power Divider
241977	350 W Power Combiner/Divider
241978	600 W Power Combiner
241979	Dual 250 W, 50 ohm Termination
241980	Dual 250/500 W, 50 ohm Termination

Applying modules, combiners, splitters, and terminations to obtain 550 W.



REPLACEMENT TYPES

The following EIMAC types currently in production are for renewal use and are not suggested for new equipment design. Data on these tubes may be obtained from the Application Engineering Department of EIMAC.

177WA/6549W
2-01C
2-50A
2-150D
2-240A
250R
250TH
250TL
253
254W
264/8476
290A
2CX10,000F*
304TH
304TL
3C24
3CPN10A5
3CPX100A5
3CV30,000A1
3CW2000A7
3CW5000A7
3CW5000F7
3CV30,000A1*
3CX100A5
4-400B/7527
450TH
450TL
4CN15A*
4CW2000A/8244
4CW10,000A/8661
4CX125C*
4E27A/5-125B
4PR60B
4PR1000B
4W300B/8249*
4X150A/7304*
4X150D*
4X150G/8172*
4X500A
592/3-200A3
5867A
6C21
6155
6156
7609*
7815RAL
7855R
7855K
826
8533W
8538B
8560A*
8745
8907
8907AL
8980
8944
C-1149
SK-300*
SK-400*
SK-500*
SK-600*
SK-610*
SK-620*
SK-630*
VS-2
Y-572BAL

*San Carlos

EQUIVALENT LIST

This index lists tubes of other manufacturers for which EIMAC types are suggested as equivalents. The data sheet for the particular EIMAC type should be consulted before direct replacement is made because of possible mechanical or electrical differences.

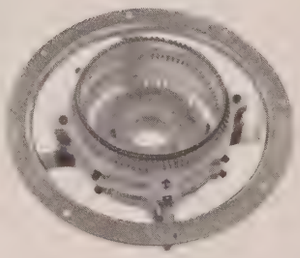
Tube Type	EIMAC Equiv.
AC55	4CX5000A/8170
AY3-65	4-65A/8165
B1109	3C24
B1135	100TH
C112	6156
C1108	4-125A/4D21
C1112	4-250A/5D22
C1136	4-400A/8438, 4-400C/6775
CV-427	4PR60C/8252W
CV-668	35T
CV-789	3C24
CV-824	4-125A
CV-1102	4-250A/5D22
CV-1350	5867A
CV-1905	4-65A/8165
CV-2130	6155
CV-2131	6156
CV-2159	4X150A/7034
CV-2416	4PR60C/8252W
CV-2487	4CX250B/7203
CV-2516	7289
CV-2519	4X150A/7304
CV-2552	100TH
CV-2572	450TH
CV-2589	250TH
CV-2611	304TH
CV-2752	4PR60C/8252W
CV-2963	4-125A/4D21
CV-2964	4-250A/5D22
CV-3879	4-400A/8438, 4-400C/6775
CV-3880	4-100A/8166
CV-3893	4X150G/8172
CV-3991	7609
CV-5176	2-01C
CV-5430	7289
CV-5959	4-400B/7527
CV-6122	4-65A/8165
CV-6131	4PR60C/8252W
CV-6137	4CX250B/7203
CV-6184	4CX10,000D/8171
CV-8295	4CX5000A/8170
CV-8698	4CX350A/8321
CV-11106	5CX1500A
CV-11107	4CX35,000C/8349
DET-18	35T
E-250A	6156
E-900	250TH
E-3033	4CX10,000D/8171
ET-1000	250TH
ITW-10-1	3CW10,000H3
Q160-1	4-125A/4D21
Q400-1	4-400A/8438, 4-400C/6775
QB3-200	4-65A/8165
QB3-300	6155
QB3-300A	4-125A
QB3.5-750	6156
QB3.5-750GH	4-250A/5D22
QB4-250B	4-250A/5D22
QB4-1100GA	4-400A/8438, 4-400C/6775
QBL4/800	4X500A
QE61/250	4CX250B/7203
QEL1/150	4X150A/7034
QEL1/150H	7609
QEL2/200	4CX250R/7590W
QEL2/275	4CX250B/7203
QV1-150	4X150A/7304
QV1-150D	7609
QV1-150G	4X150G/8172
QV2-250G	4CX250B/7203
QY3-65A	4-65/8165
QY3-125	6155
QY3-125B	4-125A/4D21
QY4-250	6156
QY4-250B	4-250A/5D22
QY4-400	4-400B/7527
QY4-400VB	4-400A/8438, 4-400C/6775
QY4-500A	4X500A
RS-630	100TH
RS-685	4-125A/4D21
RS-1002A	4-250A/5D22
RS-1007	4-125A/4D21
RS-1026	5867A
RS-1046	3-1000H
RS-2016	4CX5000A/8170
RS-2793	4CS5000A/8170
RS-4791	4CX1000A/8168
T-1301	100TH
T-150-1	250TL
T-300-1	450TH
T-380-1	3-400Z/8163
T-1000-1	3-1000H
TB-3-350	100TH
TB-4/800	250TH
TB-750	5867A
TD-1-100A	7289
TH-4327	4E27A/5-125B
TT-16	4-125A/4D21
TT-16D	6155
2T24	3C24
3C200	250TH
3F65	4-65A/8165
3H151J	7289
3HC/151JYY	3CX100A5
3S035T	5867A
4F15R	4X150A/7034
4F17R	4X150G/8172
4F20R	7609
4F21	4-125A/4D21
4F84	7843
4H135M	4X150A/7034
4H160M	4CX250B/7203
4HC/160M	4CX250B/7203
4S016-T	4-125A/4D21
4S040T	4-250A/5D22
4T10R	7289
4T16	100TL
4T17	100TH
4T25R	4X150G/8172
5F15R	4X150A/7034
5F16R	7609
5F17R	4X150G/8172
5F20RA	4CX250B/7203
5F22	4-250A/5D22
5F22A	6156
5F23	4-400A/8438, 4-400C/6775
5F23A	7527/4-400B
5F25R	4CX250FG/8621
5F35R	4CX350A/8321
5T20	250TL
5T21	250TH
5T30	450TL
5T31	450TH
5T34	304TL
5T35	304TH
6F50R	4X500A
6F50RA	4X500A
6T51	3-1000H
7F25	4-1000A/8166
7F25A	4-1000A/8166
8F10R	4CX5000A/8170
8F11R	4CX10,000D/8171
35R	2-50A
381	7289
152RA	2-150D
3861B	4X150A/7034
7092	3-1000H
7525	4-1000A/8166

SOCKETS

These sockets and accessories are specifically designed for use with EIMAC tubes. Choice of the proper socket insures longer tube life and better performance. All sockets incorporate low loss insulating materials. All metal parts are plated for corrosion protection. Tube contact surfaces are non-ferrous spring alloy, silver plated for good RF conductivity and heat treated for positive contact and long life. Open construction permits adequate air flow for tube cooling.

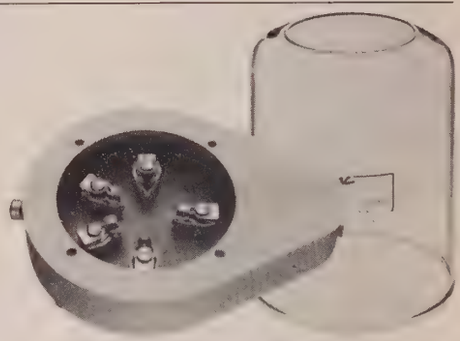
SK-184

SK-184A, SK-265A and SK-291A resemble SK-184 in general appearance



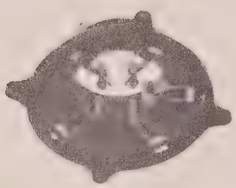
SK-300A

SK-300 and SK-310 resemble SK-300A in general appearance



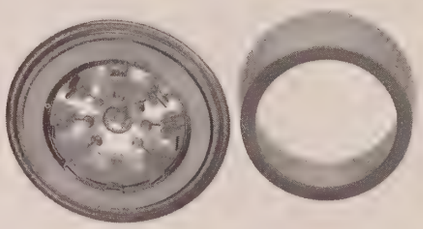
SK-400 SK-406

SK-500 resembles SK-400 in general appearance
SK-416, SK-506, and SK-516 resemble SK-406



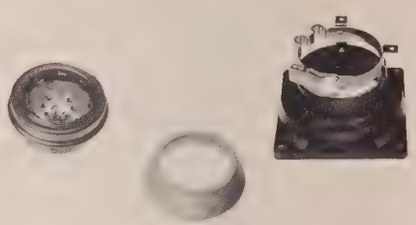
SK-410

SK-510 resembles SK-410 in general appearance



SK-600A SK-606

SK-600, SK-602, SK-602A, SK-607, SK-610, SK-610A, SK-611 and SK-611A resemble SK-600A in general appearance

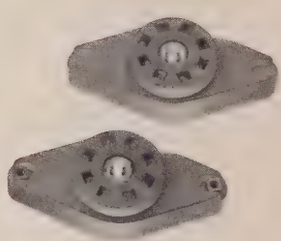


SK-620A SK-626 SK-636B

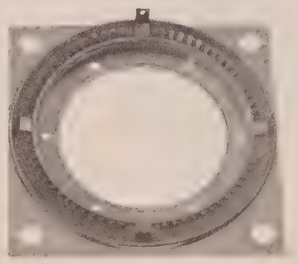
SK-630A resembles SK-620A in general appearance

SK-640

SK-650 SK-655



SK-660 SK-660A



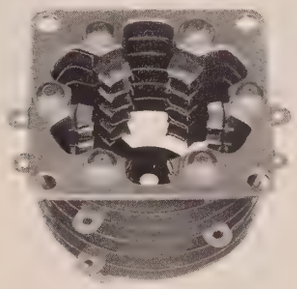
SK-680

SK-700

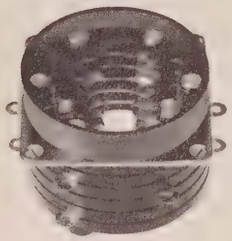
SK-710 and SK-712A resemble SK-700 in general appearance

SOCKETS

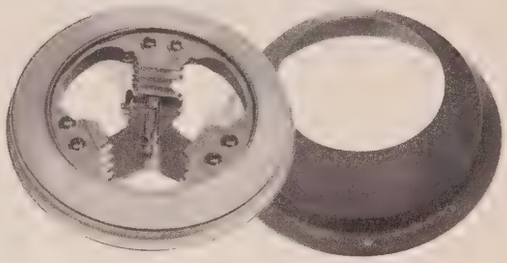
For special applications which require features different from these standard sockets, custom designed sockets are offered. These may be modifications of the standard sockets or completely new designs, manufactured to customer drawings or EIMAC design. Common modifications include contact spacing, mounting features, encapsulation of components, grounded contacts, bypass capacitors, insulating materials, contact materials, and plating.



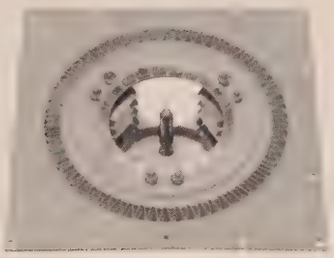
SK-740



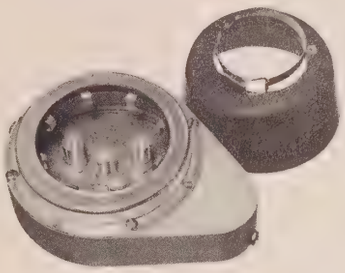
SK-760
SK-761 and SK-770 resemble SK-760



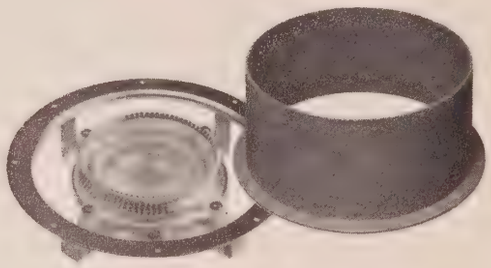
SK-800B SK-806
SK-810B and SK-890 resemble SK-800B



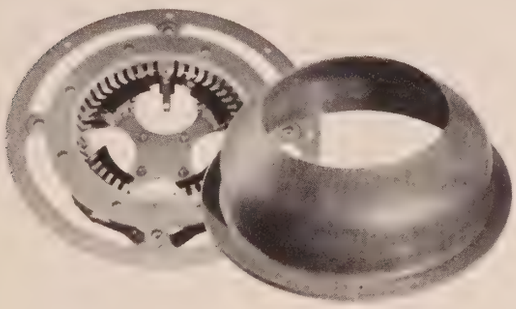
SK-820
SK-830A, SK-831, SK-840, and SK-860 resemble SK-820



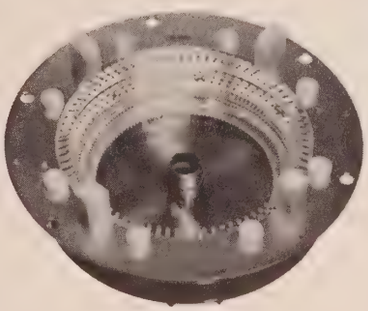
SK-900 SK-906



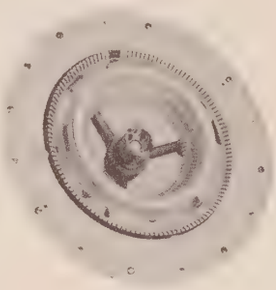
SK-1300 SK-1306
SK-1310 and SK-1320 resemble SK-1300



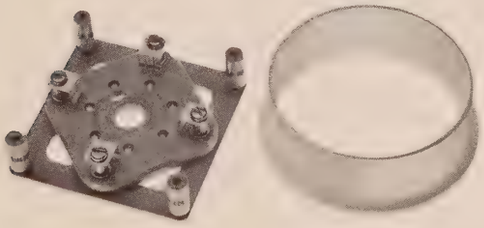
SK-1400A SK-1406
SK-1420, SK-1470A, and SK-1490 resemble SK-1400A



SK-1500A
SK-1510A resembles SK-1500A



SK-2011A
SK-2000 and SK-2001 resemble SK-2011A



SK-2200 SK-2216
SK-2210 resembles SK-2200

SK-2220

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor			Grounded Contacts	Chimney
		pF	Voltage DCWV	Element Bypassed		
SK-184	8295A	2000	1000	screen	none	C-184 included
		2500	500	suppressor		
S-184A	8295A	2000	1000	screen	suppressor	C-184 included
SK-265A	8576/264	2000	1000	screen	suppressor	C-265 included
SK-291A	290/290A	2000	1000	screen	suppressor	C-291 included
SK-300A	4CX5000A / 8170 4CX5000R / 8170W 4CX5000J	none	—	—	none	SK-306
	4CW10,000A 4CW25,000A					none required
	4CX10,000D / 8171 4CX10,000J					SK-1306
	4CX15,000A / 8281 4CX15,000J / 8910					SK-316
	8989					SK-336
SK-310	4CV35,000A	none	—	—	none	none required
SK-320	4CX20,000A / 8990	none	—	—	—	SK-326

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor			Grounded Contacts	Chimney
		pF	Voltage DCWV	Element Bypassed		
SK-410	4-125A 4D21 4PR125A 8247 4PR250C 8248	—	—	—	none	none required
	4-250A 5D22 4-400A 8438 4-400B 7627 4-400C 6775 4PR400A 8188 5867A 6155 6156 3-500Z					SK-406
	3-400Z 8163					SK-416
	4-500A 5-500A					SK-426
SK-510	4-1000A 8166 4PR1000A 8189 4PR1000B 8960	—	—	—	none	SK-506
	3-1000Z 3-1000H					SK-516

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor			Grounded Contacts	Chimney
		pF	Voltage DCWV	Element Bypassed		
SK-600A SK-611*	4CX250B 7203 4CX250BC 8957 4CX250FG 8621 4CX250R 7850W 4CX350A 8321 4CX350F 8322 4CX350FJ 8904 4X150A 7034 7609	2700	1000	screen	none	SK-606
	8930					SK-646
	4W300B 8249					none required

*SK-600A body with contacts and Kel-F retainer ring furnished separately; no bypass capacitor.

SK-607	4CX600J 8809	2700	1000	screen	none	SK-646
	4CX600JA 8921					SK-656
SK-610A	same as SK-600A	2700	1000	screen	cathode	see SK-600A listing

SK-612	same as SK-600A	2700	400	screen	cathode, one heater	see SK-600A listing
SK-620A	SK-600A	1100	1000	screen	none	SK-626 or SK-636B†

†Chimney includes anode connector, clamp and socket hold-down provision.

SK-621	same as SK-600A	525	500	cathode	screen	SK-626 or SK-636B†

†Chimney includes anode connector, clamp and socket hold-down provision.

SK-630A	SK-600A	1100	1000	screen	cathode	SK-626 or SK-636B†

†Chimney includes anode connector, clamp and socket hold-down provision.

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor			Grounded Contacts	Chimney
		pF	Voltage DCWV	Element Bypassed		
SK-640	same as SK-600A	—	—	—	none	see SK-600A listing
SK-650 SK-655*	same as SK-600A	1100	1000	screen	none	SK-626

*SK-650 is a lightweight, simplified socket. SK-655 is matching bypass capacitor. It can also be used with coaxial-based tubes in family (e.g., 4CPX250K).

SK-660* SK-660A*† SK-661‡	same as SK-600A plus: 4CS250R	—	—	—	none	none required for 4CS250R see SK-600A listing

*High alumina ceramic body for heat-sink application; with threaded inserts.
†Same as SK-660, threaded inserts deleted.
‡BeO body for heat-sink application.

SK-680*	4CW800B 4CW800F	6000	500	screen	none	none required
	4CX600B 4CX600F					none available

*SK-680 is a screen bypass unit and fastens directly to tube.

SK-700 SK-712A*	4CX125C 4CX125F	1100	400	screen	one heater	none required
	4CX300A 8167 4CX300Y 8561					SK-606

*Same as SK-700 with encapsulated bypass capacitor.

SK-710 SK-711A*	same as SK-700	1100	400	screen	cathode, one heater	SK-606

*Same as SK-710 with encapsulated bypass capacitor.

SK-740	same as SK-700 plus: 4CN15A	—	—	—	none	none available
SK-760 SK-761*	same as SK-700 plus: 4CN15A	—	—	—	none	integral
SK-770					screen	

*SK-761 is a low capacitance version of the SK-760.

SK-800B	4CX1000A 8168	1500	400	screen	none	SK-806
SK-801	4CX1500B 8660	4000				
SK-810B SK-890B*	4CW2000A 8244	1500			cathode one heater	
SK-811		4000				none required

*Same as SK-800B with screen bypass capacitor isolated from screen contacts.

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor			Grounded Contacts	Chimney
		pF	Voltage DCWV	Element Bypassed		
SK-820	4CX1000K / 8352	500	400	cathode	screen	SK-806
SK-830A		2500	1000	screen	cathode	
SK-831	4CX1000K / 8352 / 4CX1500A	2500	1000	screen	none	
SK-840	5CX1500A	2500	1000	screen	suppressor	
SK-860 / SK-870	3CX1000A7 / 8283	—	—	—	none / grid	SK-816
SK-900	4X500A	650	700	screen	none	SK-906
SK-1300	3CW10,000A3 3CW20,000A1 3CW20,000A3 3CW20,000A7	—	—	—	none	none required
	3CX5,000A3					SK-1316
	3CX10,000A1 / 8158 3CX10,000A3 / 8159 3CX10,000A7 / 8160 3CX15,000A3 3CX15,000A7					SK-1306
	3CX20,000A3 3CX20,000A7					none available
SK-1310	3CV30,000A1 3CV30,000A3	—	—	—	—	none required
SK-1320	3CX5000A3	—	—	—	grid	SK-1316
	same as SK-1300					see SK-1300 listing
SK-1400A	4CX3000A / 8169	1800	1000	screen	none	SK-1406
SK-1420	5CX3000A / 8966	1800	1000	screen	suppressor	SK-1426
SK-1470A	4CX3000A / 8169	—	—	—	screen	SK-1406
SK-1490	4CV8000A	—	—	—	—	none required
SK-1500A* SK-1510A†	4CX35,000C / 8349	—	—	—	—	none available
	4CV100,000C / 8351 4CW100,000D					none required

*Special assembly for stem cooling and mounting flanges. Bypass capacitors available.
†Modified SK-1500A. Tube seating device added.

SOCKETS AND CHIMNEYS

EIMAC Air-System Socket	Tube	Bypass Capacitor pF	Bypass Capacitor Voltage DCWV	Bypass Capacitor Element Bypassed	Grounded Contacts	Chimney
SK-1710	4CV250,000B 4CW250,000B	Filament Connector (2 required)			—	—
SK-1712	9008/X-2062J 9009/X-2062K	Control Grid Connector				SK-2316* SK-2306*

*Provide containment for protective gas atmosphere

SK-1920	8873‡ 8560A 8560AS	Plate BeO Thermal Link			—	—
SK-2000	4CV50,000E 4CV50,000J 4CW50,000E 4CW50,000J 4CW100,000E	7200	4000	screen	filament	none required
SK-2001					none	
SK-2011A†	same as SK-2000	11,000	4000	screen	none	none required
SK-2200	3CX1500A7 ‡ 8877	—	—	—	none	SK-2216
SK-2210					grid	
SK-2220	8938‡	—	—	—	grid	

†Preferred for radio frequency applications
‡Note: Collets are available separately; see collet listing

SK-2310	8971/X-2177 (2 required) 8972/X-2176 (3 required) 8973/X-2170 (2 required) 8974/X-2159 (3 required)	Filament power and water connector
SK-2315	8971/X-2177 (1 required) 8972/X-2176 (1 required) 8973/X-2170 (1 required) 8974/X-2159 (1 required)	Filament RF connector
SK-2322 or SK-2323	8973/X-2170 (2 required) 8974/X-2159 (2 required) 9009/X-2062K (2 required)	Plate Water Connector
SK-2320 or SK-2321		Alternate Plate Water Connector

TUBE COLLETS AND CONNECTORS

Tube	Terminal	EIMAC Part Number
3CW5000A1 3CW5000A3 3CX2500A3 3CX3000A1 3CX3000A7 3CX4500A3 3CX4500A7	Filament (inner) Filament (outer)	149575 149576
3CX400U7	Heater (inner) Heater (outer) Cathode Grid Plate	008290 008291 008292 882931 154418
3CX600U7	Heater (inner)	008290
4X150G 4CX250K 4CX250M 4CPX250K	Heater Cathode Grid Screen Plate	008290 008291 008292 882931 008294

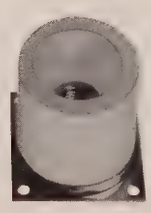
Tube	Terminal	EIMAC Part Number
8873 8874 8875	Grid Plate (8874 only)	882931 008294
8877 3CX1500A7	Grid Collet Grid Clip	135305 149842
8938 8962	Heater (inner) Heater (outer) Cathode Grid Plate	135310 135307 135306 135305 135304
3CX10,000U7	Plate Collet Assy Grid Collet Assy Heater/Cathode Collet Assy Heater Collet Assy	720635 720636 720637 720638

PLANAR TRIODE HEAT RADIATORS

EIMAC Type Number	Tube Type	Max. Operating Voltage
SK-3010	8755 8847A Y-518 Y-519	10 kVdc
SK-3020	Y-540 Y-634	10 kVdc

EIMAC Type Number	Tube Type	Max. Operating Voltage
SK-3062	8940 8941 8942 Y-678 Y-690A Y-779	15 kVdc
SK-3064	8941 8942 Y-678 Y-690A	15 kVdc

SK-3010



SK-3020

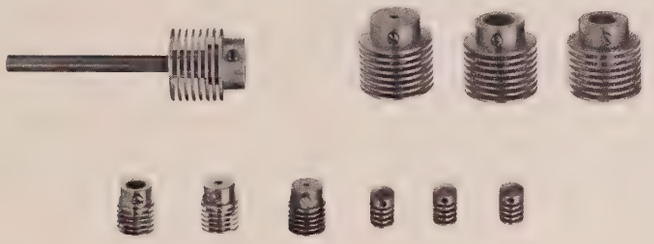
PARTS KITS

EIMAC Parts Kits are available for repair of the following sockets:

Socket SK-300/SK-300A order Parts kit-300
Socket SK-840 order Parts kit-840
Socket SK-1300/SK-1320 order Parts kit-1300
Socket SK-1500—SK-1510 order Parts kit-1500

HEAT DISSIPATING CONNECTORS

EIMAC HR Heat Dissipating Connectors are used to make electrical connections to the plate and grid terminals of EIMAC Tubes, and at the same time, provide efficient heat transfer from the tube element and glass seal to the air. These connectors are machined from solid dural rod and are supplied with the necessary set screws. For marking per MIL-STD-130B add prefix letter "M" to the part number for connectors HR-4 through HR-10. Note HR-1 through HR-3 are too small to permit marking.



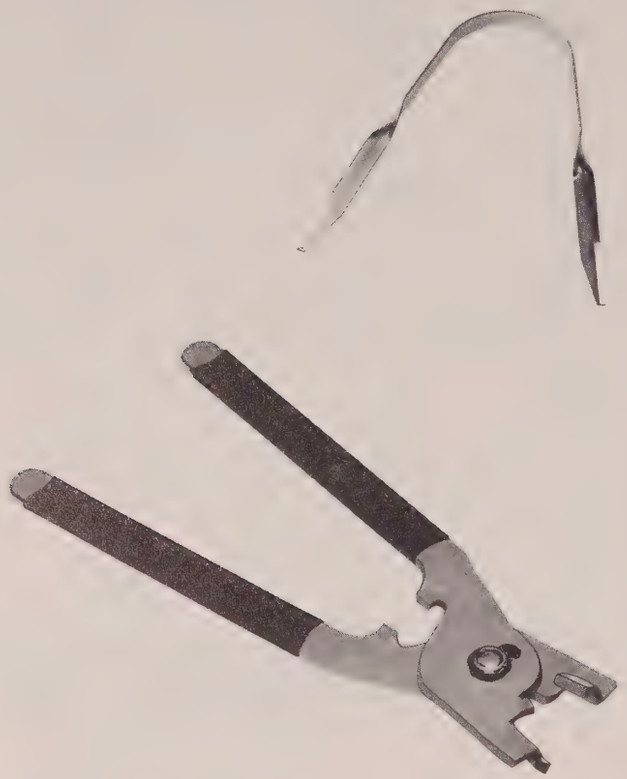
Type	Height	Dia.	Hole Dia.
HR-1	11/16"	1/2"	.052"
HR-2	11/16"	1/2"	.062"
HR-3	11/16"	1/2"	.072"
HR-4	7/8"	3/4"	.102"
HR-5	7/8"	3/4"	.127"
HR-6	7/8"	3/4"	.367"
HR-7	1-11/32"	1-3/8"	.127"
HR-8	1-11/32"	1-3/8"	.575"
HR-9	1-11/32"	1-3/8"	.569"
HR-10	1-11/32"	1-3/8"	.510"

HEAT DISSIPATING CONNECTORS (Cross-Reference)

Tube	Plate Connector	Grid Connector
2-50A	HR-3	—
2-150D	HR-6	—
3C24	HR-1	HR-1
3-500Z	HR-6	—
3-1000Z/8164	HR-8	—
3-1000H	HR-8	
4-65A	HR-6	—
4-125A/4D21	HR-6	—
4-250A/5D22	HR-6	—
4-400B/7527	HR-6	—
4-400C/6775	HR-6	—
4PR60C/8252W	HR-8	—
4PR65A/8187	HR-6	—
4PR125A/8247	HR-6	—
4PR250C/8248	HR-6	—
4PR1000A/8189	HR-8	—
4-500A	HR-6	—
4-1000A/8189	HR-8	—
5-500A	HR-6	—
6C21	HR-8	HR-8
25T	HR-1	—
35T	HR-3	—
100TH-TL	HR-6	HR-2

Tube	Plate Connector	Grid Connector
177WA	HR-6	—
250R	HR-6	—
250TH-TL	HR-6	HR-3
253	HR-8	—
254W	HR-3	HR-3
304TH-TL	HR-7	HR-6
450TH-TL	HR-8	HR-8
592/3-200A3	HR-10	HR-5
5867A	HR-6	—
6155	HR-6	—
6156	HR-6	—
6775	HR-6	—
7527	HR-6	—
8960	HR-8	—

TUBE EXTRACTORS



SK-604

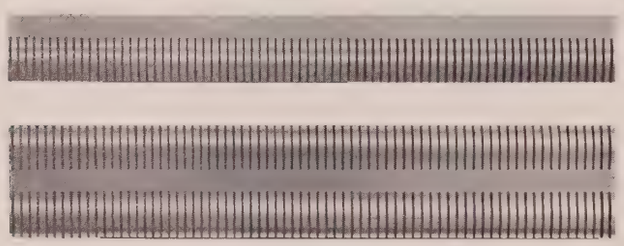
This tube extractor is designed for use in removing coaxial-base and 9-pin-base tubes from their sockets without damage. The 4X150 series and 4CX250 series tubes may be removed with this extractor.

SK-605

These special pliers are designed for use in removing breechlock base tubes from their sockets without damage. The 4CX300 series and 4CX1000/4CX1500 series tubes may be removed with these pliers.

For 8933 use EIMAC extractor 157521.

PREFORMED CONTACT FINGER STOCK



EIMAC Preformed Finger Stock is a prepared strip of spring material slotted and formed into a series of fingers designed to make a sliding contact. It is especially suitable for making connections to tubes with coaxial terminals or to moving parts, such as long-line and cavity circuits or screen-room doors. EIMAC finger stock is available in 9 different shapes and sizes, three of which incorporate "spooned" contact fingers. All sizes come in standard 36 inch lengths. Standard stock is heat treated and silver plated. EIMAC Contact Finger Stock is available on special factory order in the following semi-finished states: Slotted and formed (Not heat treated or plated). Slotted, formed, and heat treated (Not plated). Slotted, formed, and plated (Not heat treated). Untreated stock are listed as CF101, CF301, CF501 and CF901.

Type	Finger Radius (inches)	Finger Width (inches)	Slot Width (inches)	Slot Depth (inches)	Comments
CF-100(*)	1/16	1/8	0.040	9/32	spooned
CF-200	1/16	1/8	0.040	9/32	double-edged
CF-300(*)	13/64	1/8	0.040	19/32	finger tip has reverse radius
CF-400	13/64	1/8	0.040	35/64	double-edged
CF-500(*)	16/32	1/8	0.040	7/8	finger tip has reverse radius
CF-600	15/32	1/8	0.040	29/32	double-edged with reverse tip radii
CF-700	1/16	1/8	0.040	9/32	spooned
CF-800	1/16	1/8	0.040	15/32	spooned and bent
CF-900(*)	0.030	1/16	0.020	15/64	smallest fingers

*Available untreated

division
varian

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